F.Y.B.Tech. (C/M/E) Sem-I
chemistry. Dt: 21/11/15

Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering

(An Autonomous Institution Affiliated to University of Mumbai)

Subject: Chemistry
Subject Code: BT-106
End Sem-I 50 Marks
Note: All questions are compulsory

1A	Define Acid value with experimental details and its significance	5
B	Difference between BOD and COD	5
C	Define Lubricants and explain its role	5
D	Define Nano Materials with its applications	5
2A	Explain Hard water with chemical reaction and explain temparorary, Permanent hardness of water.	5
B	Define Polymer with suitable example and different types of conducting Polymer with example	5
C	Write short note on carbon nanotube	5
3 A.	Find acid value of 5.0 gram vegetable oil required 3.0 mL of 0.01 N KOH during the sample titration using phenolphthalein indicator. (Blank titration Reading=0 mL)	5
B.	A water sample contains: $Ca(HCO_3)_2$ = 10 mg/L, $Mg(HCO_3)_2$ = 10 mg/L, $CaSO_4$ = 10 mg/L. Calculate , Temporary, permanent , Total Hardness of water sample (Given= Mass $Ca(HCO_3)_2$ =162, $Mg(HCO_3)_2$ =146, $CaSO_4$ = 136)	5
C	Convert units 10 ppm = ^{0}C, ^{0}Fr, Mg/L and 10 ^{0}C = ppm, ^{0}Fr, Mg/L	5

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chemistry. Dt: 21/11/15

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Refer

1. **Applied chemistry By Dr. Jayshree Parikh Tech-Max Pulication**
2. **Engineering Chemistry 15th Edition Jain and Jain**

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Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

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ATKT Examination for F.Y.BTech (Civil/Mechanical/Electrical) ~~2015-16~~

F.Y.B.Tech. (C/M/E) Sem- I.

Applied Physics-I

Total Marks: 50

Duration: $1\frac{1}{2}$ Hours

CLASS/SEM : **F.Y.BTech. (C/M/E) Sem-I**

SUBJECT : **APPLIED PHYSICS-I**

SUBJECT CODE: FE102

- Attempt any FIVE questions out of SEVEN questions
- **Answers to all sub questions should be grouped together.**
- Draw diagrams wherever necessary.
- Figures to the right indicate full marks.

Master file.

Good luck!

Q. No. ***Answer any five. [6 marks for (a) and 4 marks for (b)]***

1

(a) Derive an expression for path difference for reflected rays in wedge shaped films and hence state conditions for constructive and destructive interference with monochromatic light.

(b) Calculate the angular spread of ruby laser beam due to diffraction, if the beam emerges through a 3mm diameter mirror. How large would be the diameter of this beam when it is incident on a satellite 300km above earth?

2

(a) Derive an expression for intensity when light undergoes diffraction through a single slit.

(b) An electron and a 150 gm baseball are traveling at 220 m/s measured to an accuracy of 0.065%. Calculate the uncertainty in position of each of the bodies. Compare the two values and comment.

3

(a) Differentiate between:

(i) Single mode and multimode optical fibers.

(ii) Step index and graded index optical fibers.

(b) Evaluate the first energy level of an electron enclosed in a box of width 10A°. Compare it with those of glass marble of mass 1gm, contained in a box of width 20cm. Can this level of marble be measured experimentally?

4

(a) Explain Heisenberg's uncertainty principle using concept of wave group.

(b) The interaction of chromium ions with ruby lattice gives a wavelength spread of 0.53 nm around its wavelength. If length of ruby rod is 2cm (refractive index 1.75), how many

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SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

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F.Y.B.Tech. (C/M/E) Sem-I.

Applied Physics-I

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CLASS/SEM : **F.Y.BTech. (C/M/E) Sem-I**

SUBJECT : **APPLIED PHYSICS-I**

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F.Y.B.Tech (CIM/E) Sem I
Applied physics - I. D1. 21/11/15

longitudinal cavity modes would the ruby laser emission contain? Also calculate the coherence length of the given laser.

5

(a) Write a note on He-Ne laser.

(b) Draw the intensity distribution curve for a double slit diffraction for the ratio b=3a.

6

(a) Write a short note on CO_2 laser.

(b) A GRIN optical fiber has core diameter of 60μm, a core index of 1.48 and a cladding index of 1.41. Wavelength of light source is 0.8μm. Determine number of modes propagating in the fiber.

7

(a) Using Schrödinger's time independent equation, deduce the energy Eigen values and Eigen functions for a particle in a box of infinite height and having width L.

(b) Newton's rings are formed with reflected light of wavelength 5.895×10^{-7}m with a liquid in between the plane and the curved surfaces. The diameter of the 5th dark ring is 0.003m and the radius of curvature of the lens is 1m. Calculate refractive index of the liquid.

(2)

F.Y.B.Tech (CIM/E) Sem I
Applied physics - I. D1. 21/11/15

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(2)

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F.Y.B.Tech. (C/M/E) Sem I.
Engineering Graphics - I.

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks: 100 Duration: 03 Hours

Class: F.Y. B.Tech. Semester: I Program: C/M/E

Name of the Course: Engineering Graphics I Course Code : BT 103

Master file.

Instructions:

1. Question No 1 is compulsory.
2. Use first Angle Method of Projection.
3. Attempt any four questions out of remaining six.
4. Draw neat diagrams
5. Assume suitable data if necessary

Q1(a)	End P of the line PQ is in fourth quadrant, while end Q is in the second quadrant. The elevation of the line is 45 degree to XY. The distance between the end projectors is 80 mm and distance between projectors through traces is 50 mm. Draw its projections. Find its true length and true inclinations, if its HT is 40 mm in front of VP and end Q is 60 mm above HP.	10
(b)	Construct an Archemedian spiral of one convolution , the greatest radii is 100 mm and shortest radii is 25 mm. Draw normal and tangent to the curve.	10
Q2(a)	Elevation of a line AB is 75 mm and is inclined to XY line at 45 degree. End A is 25 mm above HP and end B is 10 mm behind VP. Draw its projections if length of line AB is 95 mm and end B is in third quadrant. Find the inclination of the line AB with HP.	10
(b)	A stick 88 mm long is initially tangent to the semi circle of 60 mm diameter at its left side corner. This stick now rolls over the circumference of the semi circle without slipping. Draw the curve and name it.	10
Q3(a)	A pentagonal Plate of 25 mm side has one of its side in the HP. making an angle 45 degree to the VP. Draw its projections if its surface is inclined at 45 degree to the HP.	10
(b)	A rectangular plane of 30 × 50 mm is resting on one of its corner on VP. with diagonal passing through that corner inclined to HP at 30 degree and to VP at 45 degree. Draw its projections.	10
Q4(a)	A pentagonal pyramid of 30 mm edge of base and 60 mm axis height is lying on one of its triangular surface in the VP and the edge of base contained by triangular face makes an angle of 45 degree to the HP. Draw its front view and top view having base nearer to the observer.	10
(b)	A square pyramid with edge of base 30 mm, axis height 50 mm has its apex in both HP and VP such that the axis is inclined at 30 degree to HP and 60 degree to VP and parallel to profile plane. Draw its projections.	10
Q5.	A cone of 60 mm diameter and 75 mm axis height rest on the ground (HP) on one of its generators so that the axis is parallel to the VP. It is cut by the section plane perpendicular to the HP, inclined at 30 degree to VP. And bisecting the axis. Draw the sectional FV , TV and the true shape of a section.	20
Q6.	A cone of base diameter 80 mm and axis height 100 mm is resting on its base on the HP. It is penetrated by a horizontal rectangular hole such that the axis of hole is perpendicular to VP and parallel to HP. One of the corner of hole is 25 mm above and 20 mm on the right side from the left most point of the base of cone. The smaller side of hole is inclined at 30 degree with the HP. Draw the Development of the lateral surface of	20

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F.Y.B.Tech. (C/M/E) Sem I.
Engineering Graphics - I.

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

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Q6.	A cone of base diameter 80 mm and axis height 100 mm is resting on its base on the HP. It is penetrated by a horizontal rectangular hole such that the axis of hole is perpendicular to VP and parallel to HP. One of the corner of hole is 25 mm above and 20 mm on the right side from the left most point of the base of cone. The smaller side of hole is inclined at 30 degree with the HP. Draw the Development of the lateral surface of	20

F.Y. B.Tech. (C/M/E) Sem I.
Engineering Graphics - I Dt. 28/11/15

cone with hole.

Q7(a) A pentagonal pyramid side of base 35 mm and height 70mm rests on its base on the HP with one side of base perpendicular to the VP, such that the true shape of the section in an isosceles triangle of maximum possible base and maximum height. Draw its FV, sectional TV and true shape of section. 10

(b) A tetrahedron PQRS of 50 mm long edges has edge PQ in the HP. The edge RS is inclined at 30 degree and 45 degree to the HP and the VP respectively. Draw its projections. 10

F.Y.B.Tech.(C/M/E) Sem I.
Engineering Graphics - I Dt. 28/11/15

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(b) A tetrahedron PQRS of 50 mm long edges has edge PQ in the HP. The edge RS is inclined at 30 degree and 45 degree to the HP and the VP respectively. Draw its projections. 10

File
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F.E. (C/M/E) Sem I.
chemistry.

Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering

(An Autonomous Institution Affiliated to University of Mumbai)

Subject:	**Chemistry**
Subject Code:	BT-106
End Sem-I	75 Marks
Time:	3.0 H
Note: All questions are compulsory	Master file.

1A	Define plain carbon Steel. What are limitation of plain carbon steel	5
B	Define Nano Materials and Explain Properties affected with particle Size	5
C	Write short note on carbon nanotube	5
2A	Classify Different type of Lubricants and Explain in Details	10
B	Difference between BOD and COD	5
C	Explain Physical testing of Lubricants with significance	5
3 A	Explain Reverse osmosis and its application	5
B	Define Hardness water with chemical reaction and explain temparorary, Permanent hardness of water.	5
C.	Define Polymer with suitable example and different types of conducting Polymer with example	10
4 A	Find acid value of 10 gram vegetable oil required 4 mL of 0.01 N KOH during the sample titration using phenolphthalein indicator. (Blank titration Reading=0 mL) (1)	5

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F.E (C/M/E) Sem I
chemistry

Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering

(An Autonomous Institution Affiliated to University of Mumbai)

Subject:	**Chemistry**
Subject Code:	BT-106
End Sem-I	75 Marks
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F.E. (c/m/E) Sem I.
Chemistry. Dt. 26/11/15

B. EDTA titration, 10 mL of EDTA required to 10 mg of Standard $CaCo_3$ solution. During Hard water sample titration 9.0 ml of EDTA was consumed. After heating same water sample 4.5 ml of EDTA was consumed. Calculate temporary, Permanent and Total Hardness in ppm of the given water sample

Amount of water taken for analysis =20 mL **5**

C. A water sample contains:

$Ca(HCO_3)_2$ = 30 mg/L

$Mg(HCO_3)_2$ = 20 mg/L

$CaSO_4$ = 10 mg/L

Calculate , Temporary, permanent , Total Hardness of water sample

(Given= Mass $Ca(HCO_3)_2$ =162, $Mg(HCO_3)_2$ =146, $CaSO_4$ = 136) **5**

D Convert

100 ppm = ^0C, ^0Fr, Mg/L

25 ^0C = ppm, ^0Fr, Mg/L **5**

F.E. (c/m/E) Sem I.
Chemistry. Dt. 26/11/15

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F.Y.B.Tech. CC/M/E) Sem-I
Applied Physics - I

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21/11/15

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SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

End Semester Examination for F.Y.BTech (Civil/Mechanical/Electrical)

2015-16

21/11/2015

Total marks: **75** Duration: **3 Hrs**

Class/Sem: **F.Y.BTech (C/M/E) Sem-I** Subject : **APPLIED PHYSICS-I**

Course code: **BT105**

- ~~Question no. 1 is compulsory!~~
- Attempt any FOUR questions out of remaining SIX questions
- **Answers to all sub questions should be grouped together.**
- Draw diagrams wherever necessary.
- Assume suitable data if necessary.
- Figures to the right indicate full marks.

Good luck!

Master file.

Q. No.		Max Mark
1	All questions compulsory (5 marks each)	15
(a)	Using Schrödinger's time independent equation, deduce the energy Eigen values for a particle in a box of infinite height and having width L.	
(b)	Explain working of a three level pumping scheme in lasers.	
(c)	State the intensity expression for an N slit Fraunhofer diffraction and hence draw graph of $\frac{\sin^2 N\gamma}{\sin^2 \gamma}$ versus γ for N=6 and hence explain what happens to the intensity curve when N value is increased.	
	Answer any four	
2		
(a)	Write a note on antireflection coatings and dielectric mirrors.	6
(b)	A 0.1 W Ruby laser with an aperture of 5mm emits light. Calculate the areal spread and intensity of the image when the beam is focused with a lens having focal length 100mm.	3
(c)	Explain Heisenberg's uncertainty principle of position and momentum using single slit diffraction experiment.	6

(1)

F.Y.B.Tech. (C/M/E) Sem-I
Applied Physics - I

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21/11/15

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

End Semester Examination for F.Y.BTech (Civil/Mechanical/Electrical)

2015-16

21/11/2015

Total marks: **75** Duration: **3 Hrs**

Class/Sem: **F.Y.BTech (C/M/E) Sem-I** Subject : **APPLIED PHYSICS-I**

Course code: **BT105**

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(1)

F.Y.B.Tech. (C/M/E) Sem-I.

Applied Physics – I Dt. 21/11/15

3		
(a)	Write a note on He-Ne laser by giving details about its construction and pumping scheme.	6
(b)	Calculate the core and cladding refractive indices of an optical fibre given that NA is 0.22 and fractional refractive index change is 0.012.	4
(c)	Derive an expression for fringewidth in wedge shaped fringes for normal incidence of monochromatic light and hence explain why they are equidistant.	5
4		
(a)	Derive an expression for critical angle and Numerical aperture in optical fibres.	6
(b)	A thin planoconvex lens of focal length 4m rests on and is in contact with an optical flat. Using a light of wavelength 5460 A°, Newton's rings are viewed normally by reflection. What is the diameter of the 5^{th} bright ring?	4
(c)	A laser beam can be focused on an area equal to the square of its wavelength. If an Nd:YAG laser radiates energy at the ratio of 1mW, find intensity of the focused beam and mode separation in terms of frequency if length of the laser is 0.5m.	5
5		
(a)	Arrive at one dimensional Schrödinger's time dependent equation and reduce it to the time independent form.	7
(b)	A diffraction grating with a width of 2cm contains 1000 lines/cm across that width. For an incident wavelength of 600 nm, what is the smallest wavelength difference this grating can resolve in the second order?	3
(c)	How many modes can propagate in a STIN fibre with a core diameter 40μm, if refractive indices of its core and cladding are 1.461 and 1.456 respectively? Given that light from Ruby laser is incident into the fibre. Also, explain why single mode propagation cannot be supported by GRIN fibres.	5
6		
(a)	Derive an expression for intensity when Fraunhofer diffraction takes place through a double slit.	6
(b)	Using Heisenberg's uncertainty principle, prove that electron cannot be a nucleon.	4
(c)	Derive an expression for path difference in thin films of equal thickness in transmitted light and hence state the conditions of constructive and destructive interference.	5
7		
(a)	Explain the construction and reconstruction methods of Holography using LASERs	6
(b)	Wavelengths can be determined with accuracies of one part in 10^6. What is the uncertainty in the position of a $1A^{\circ}$ X-ray photon when its wavelength is simultaneously measured?	4
(c)	Derive an expression for resolving power and dispersive power of a diffraction grating	5

(2)

F.Y.B.Tech. (C/M/E) Sem-I.
Applied Physics – I Dt. 21/11/15

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(2)

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18/11/2015

F.E (C/M/E) Sem I
Basic Electrical & electronics Engg. I

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar,Andheri(West),Mumbai 400 058

(A Government Aided Autonomous Institute)

END SEMESTER

Master file.

Duration: 3 hours Marks: 100

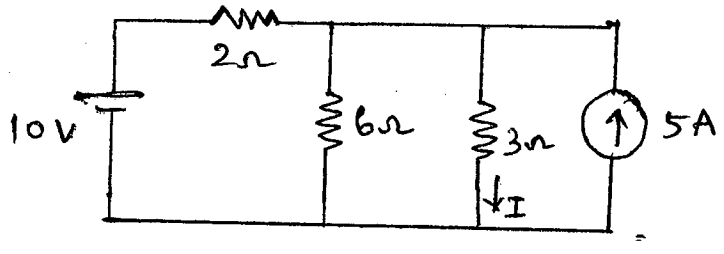
Subject: **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING I**

Class/Branch: FE- (C/M/E) Semester: I

Note:

Question no 1 is compulsory
Answer any 4 of the remaining 6 questions
Assume suitable data if required.
Figures to right indicate full marks.
Answers to all sub-questions should be grouped together.

1a Using source transformation find I 4



b. Two currents are represented by $I_1=15 \sin(wt+\pi/3)$ and $I_2=15 \sin(wt+\pi/4)$ .These currents are fed into a common conductor. Find the total current, if the conductor has a resistance of 50Ω,what will be the energy loss in 10 hours. 4

c. Derive the relation between power in delta and star system 4

d. What are the losses in a transformer ? Why rating of the transformer is expressed in KVA and not in KW. 4

e. Justify why Single phase induction motors are not self starting. 4

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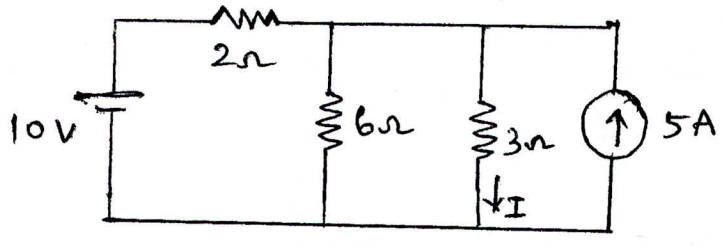

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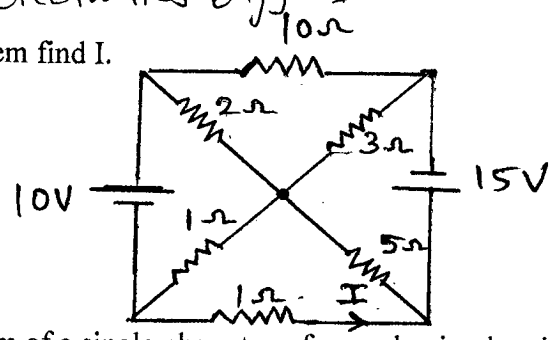
F.E.(CC/M/E) Sem I. Dt. 18/11/15

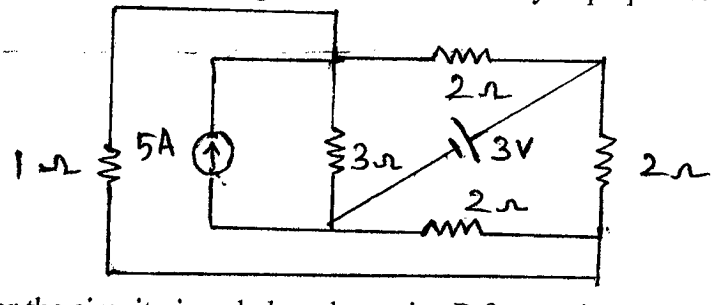
Basic Electrical & Electronics Engg - I

2a Using Nortons's theorem find I. 8

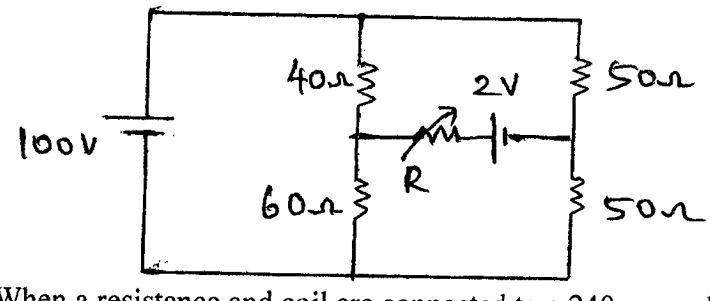


b. Draw the phasor diagram of a single phase transformer having lagging power factor load. 4

c. Find the current through the 1Ω resistance by Superposition theorem . 8



3a. For the circuit given below determine R for maximum power transfer.Also calculate the maximum power. 6



b. When a resistance and coil are connected to a 240 v supply ,current of 3A flows lagging 37° behind the supply voltage while the voltage across the coil is 171V.Find the resistance of the resistor, resistance and reactance of the coil. 10

c. Explain the working principle of three phase induction machines. 4

4a A25KVA single phase transformer has load cycle for a day as follows; 10

15KW at 0.8pf for 6 hours
20KW at 0.9pf for 10 hours
10KW at 0.9pf for 4 hours
No load condition for 4 hours.

The iron loss is 400V and the full load copper loss is 500W.Calculate the all day efficiency

b. Explain the construction and working of dc motor with neat diagrams. 10

F.E.(C/M/E) Sem I. Dt. 18/11/15

Basic Electrical & Electronics Engg - I

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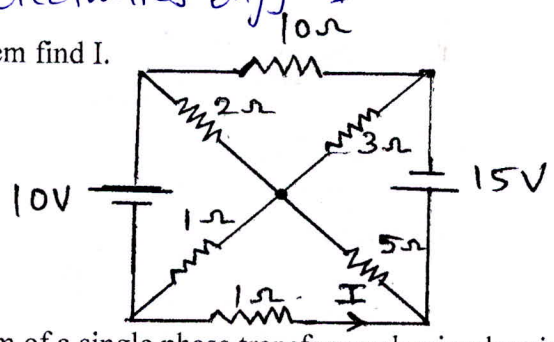

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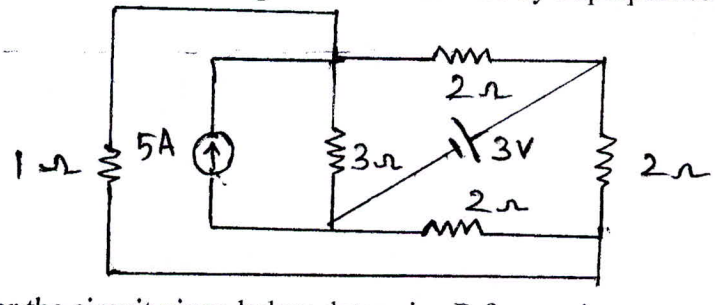

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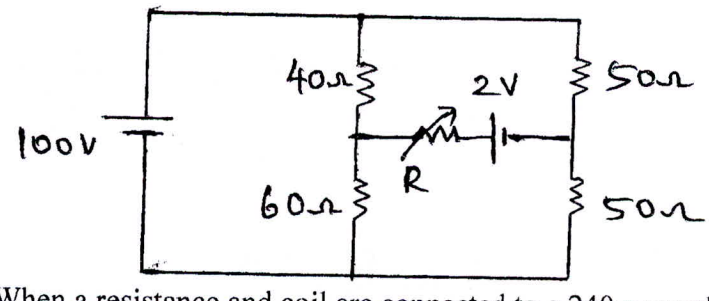

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F.E. (CIM/E) Sem I - Dt. 18/11/15

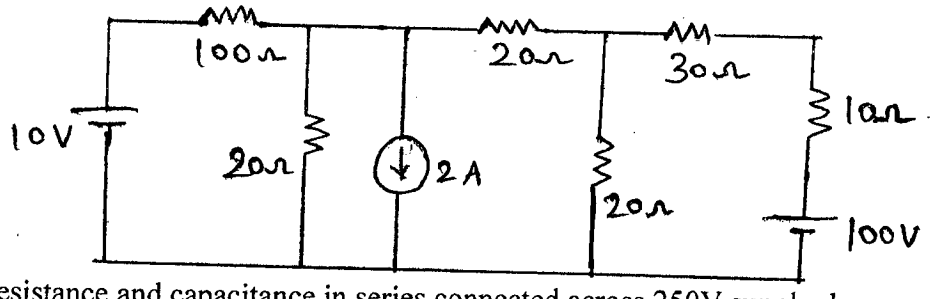
Basic Electrical & Electronics Engg - 1.

5a Find the values of circuit elements and reactive voltamperes drawn for a balanced three phase load connected in delta and drawing a power of 12KW at 440V.power factor is 0.7 leading. 8

b. A single phase ,440v/220v ,10 KVA ,50Hz transformer has a resistance of 0.2ohms amd a reactance of 0.6ohms on high voltage side. The corresponding values of low voltage side are 0.04Ω and 0.14Ω.Calculate the percentage regulation on full load for 0.8 lagging power ,0.8 leading power factor and unity power factor. 8

c. Show that the average power consumed by pure inductor is zero 4

6a Find the currents through 100 ohm resistor by nodal analysis. 6



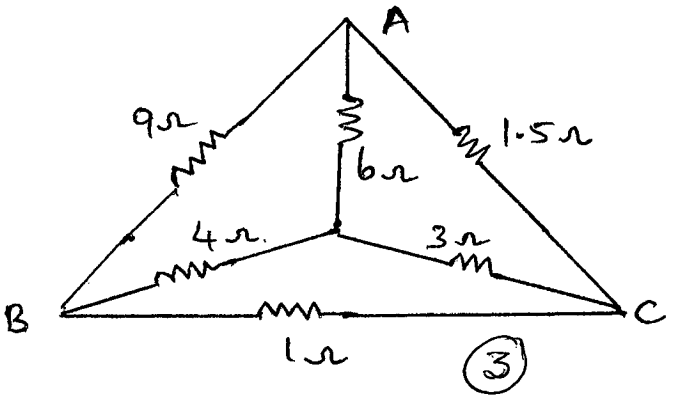
b A resistance and capacitance in series connected across 250V supply draws a current 5A at a frequency of 50Hz. When the frequency is increased to 60Hz it draws a current of 5.8A.Find the values of R and C and also the power drawn in each case. 8

c Explain types of single phase induction motors with phasor diagram. 6

7a Explain the working principle of a transformer and derive the emf equation of a single phase transformer. 4

b. Show that the total power and power factor in a three phase balanced system can be determined using two watt meters Draw the phasor diagram. 12

c. Find equivalent resistance between A and B. 4



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F.E. (CIM/E) sem I - Dt. 18/11/15

Basic Electrical & Electronics Engg - 1.

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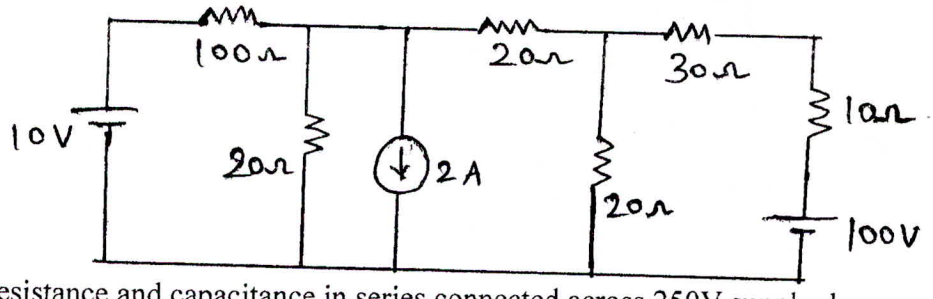

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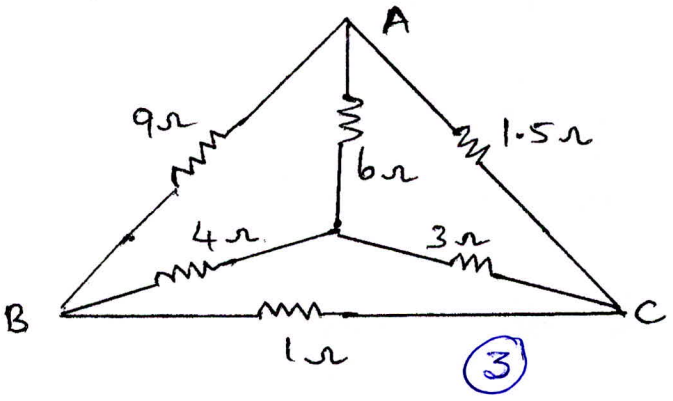

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F.Y.B.Tech-Sem I - C/M/E
Engineering Mathematics - I

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE
ANDHERI (WEST), MUMBAI - 400 058.

End Semester Exam

November 2015

Max. Marks: **100** Duration: **3 hours**
Class: **F.Y.B.Tech** Semester: **I** Program: **C/M/E**
Name of the Course: **Engineering Mathematics - I** Course Code : **BT101**

Master file.

Instructions:

1. Question No.1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams.
4. Assume suitable data if necessary.

Q. No		Maximum Marks
Q1(a)	Find the angle between the surfaces $x\log y = z^2 - 1$ and $x^2 z = 2 - y$ at P(1,1,1).	6
(b)	Prove that $\sin^5\theta = \frac{1}{16}[\sin 5\theta - 5\sin 3\theta + 10\sin\theta]$	6
(c)	If $y = (x + \sqrt{1+x^2})^n$, Prove that $(1+x^2)y_{n+2} + (2n+1)xy_{n+1} + (n^2 - p^2)y_n = 0$	8
Q2(a)	Prove that $\frac{x}{e^x - 1} = 1 - \frac{x}{2} + \frac{x^2}{12} - \frac{x^4}{720}$	6
(b)	Find the D. D of $\phi = xy^2 + yz^3$ at $(1,-1,1)$ along the direction of normal to the surface $x^2 + y^2 + z^2 = 9$ at $(1,2,2)$	6
(c)	If $\sin(\theta + i\phi) = \cos\alpha + i\sin\alpha$ prove that $\cos^4\theta = \sin^2\alpha = \sinh^4\phi$	8
Q3(a)	If $y = e^{5x}\cos x.\cos 3x$, find y_n	6
(b)	If $\arg(z+1) = \frac{\pi}{6}$ and $\arg(z-1) = \frac{2\pi}{3}$, find z.	6
(c)	If u is a homogeneous function of degree n in two variables x and y, then Prove that (i) $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = nu$ (ii) $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = n(n-1)u$	8
Q4(a)	If $\nabla\phi = r^2 e^{-r}\bar{r}$, find $\phi(r)$	6
(b)	Prove that $i\log\left(\frac{x-i}{x+i}\right) = \pi - 2\tan^{-1}x$	6

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F.Y.B.Tech-Sem I - C/M/E
Engineering Mathematics - I

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F.Y.B.Tech. Sem I, C/M/E. Dt. 16/11/15

Engineering Mathematics -I

(c) If $x=\sqrt{vw}$, $y=\sqrt{uw}$, $z=\sqrt{uv}$,

Prove that $x\frac{\partial\phi}{\partial x}+y\frac{\partial\phi}{\partial y}+z\frac{\partial\phi}{\partial z}=u\frac{\partial\phi}{\partial u}+v\frac{\partial\phi}{\partial v}+w\frac{\partial\phi}{\partial w}$, **8**

where ϕ is a function of x, y and z.

Q5(a) Evaluate $\lim_{x\to 0}\frac{e^x\sin x-x-x^2}{x^2+x\log(1-x)}$ **6**

(b) Prove that $\tan^{-1}\left[i\left(\frac{x-a}{x+a}\right)\right]=\frac{i}{2}\log\frac{x}{a}$ **6**

(c) Find all the stationary points of the following function and examine whether the function is maximum or minimum at those points. **8**

$f(x,y)=x^3+3xy^2-15x^2-15y^2+72x$

Q6(a) If $u=\frac{x^2y^2z^2}{x^2+y^2+z^2}+\cos\left(\frac{xy+yz}{x^2+y^2+z^2}\right)$, **6**

Prove that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=4\left(\frac{x^2y^2z^2}{x^2+y^2+z^2}\right)$

(b) Evaluate $\lim_{x\to 0}\left(\frac{\tan x}{x}\right)^{1/x^2}$ **6**

(c) Prove that $\bar{F}=(2xy+z)\hat{i}+(x^2+2yz^3)\hat{j}+(3y^2z^2+x)\hat{k}$ is irrotational. **8**

Hence find scalar point function ϕ such that $\bar{F}=\nabla\phi$

Q7(a) Find the roots of equation $x^5+1=0$ **6**

(b) Prove that $\tan(x+\frac{\pi}{4})=1+2x+2x^2+\frac{8}{3}x^3+\frac{10}{3}x^4+\cdots$ **6**

(c) If $z=x\log(x+r)-r$ where $r^2=x^2+y^2$, Prove that $\frac{\partial^2 z}{\partial x^2}+\frac{\partial^2 z}{\partial y^2}=\frac{1}{x+r}$ **8**

F.Y.B.Tech. Sem I, C/M/E. Dt. 16/11/15

Engineering Mathematics -I

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F.Y. B.Tech. Sem I - C/M/E -
Engineering Mathematics - I.

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Q1(a)	Expand $\sin(e^x - 1)$ in positive powers of x (up to x^4)	6
(b)	Find the point on the surface $z^2 = xy + 1$, nearest to origin. Also find the distance.	6
(c)	If $\cos(\alpha + i\beta) = x + iy$, Prove that (I) $\frac{x^2}{\cosh^2\beta} + \frac{y^2}{\sinh^2\beta} = 1$ (II) $\frac{x^2}{\cos^2\alpha} - \frac{y^2}{\sin^2\alpha} = 1$	8
Q2(a)	If $u = \sin^{-1}\left[\frac{x^{1/3} + y^{1/3}}{x^{1/2} - y^{1/2}}\right]^{1/2}$, Prove that $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \frac{\tan u}{144}(13 + \tan^2 u)$	6
(b)	If $\tan(x + iy) = \sin(u + iv)$, Prove that $\frac{\sin 2x}{\sinh 2y} = \frac{\tan u}{\tanh v}$	6
(c)	Find constants a, b and c so that $\bar{F} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$ is irrotational. Hence find scalar potential ϕ such that $\bar{F} = \nabla\phi$.	8
Q3(a)	Prove that $\cos^{-1}(ix) = \frac{\pi}{2} - i\log(x + \sqrt{x^2 + 1})$	6
(b)	Prove that $\nabla\left(\frac{\phi_1}{\phi_2}\right) = \frac{\phi_2(\nabla\phi_1) - \phi_1(\nabla\phi_2)}{(\phi_2)^2}$	6
(c)	If $x = u + v + w$, $y = uv + vw + uw$, $z = uvw$, Prove that $x\frac{\partial\phi}{\partial x} + 2y\frac{\partial\phi}{\partial y} + 3z\frac{\partial\phi}{\partial z} = u\frac{\partial\phi}{\partial u} + v\frac{\partial\phi}{\partial v} + w\frac{\partial\phi}{\partial w}$ where ϕ is a function of x, y, z	8

Lib - Re-Exam
04-01-16

F.Y. B.Tech. Sem I - C/M/E -
Engineering Mathematics - I.

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Q3(a)	Prove that $\cos^{-1}(ix) = \frac{\pi}{2} - i\log(x + \sqrt{x^2 + 1})$	6
(b)	Prove that $\nabla\left(\frac{\phi_1}{\phi_2}\right) = \frac{\phi_2(\nabla\phi_1) - \phi_1(\nabla\phi_2)}{(\phi_2)^2}$	6
(c)	If $x = u + v + w$, $y = uv + vw + uw$, $z = uvw$, Prove that $x\frac{\partial\phi}{\partial x} + 2y\frac{\partial\phi}{\partial y} + 3z\frac{\partial\phi}{\partial z} = u\frac{\partial\phi}{\partial u} + v\frac{\partial\phi}{\partial v} + w\frac{\partial\phi}{\partial w}$ where ϕ is a function of x, y, z	8

F.Y.B.Tech. Sem I - C/M/E.

Engineering Mathematics-I Dt. 04/01/16.

Q4(a) If α, β are the roots of the equation $x^2 - 2\sqrt{3}x + 4 = 0$, Prove that $\alpha^3 + \beta^3 = 0$ **6**

(b) Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at (2, 1, 2). **6**

(c) If $y = (\sin^{-1}x)^2$, prove that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - n^2y_n = 0$ **8**

Q5(a) If $u = e^{xyz}$, Prove that $\frac{\partial^3 u}{\partial x \partial y \partial z} = (1 + 3xyz + x^2y^2z^2)e^{xyz}$ **6**

(b) Prove that $\log \tan\left(x + \frac{\pi}{4}\right) = 2x + \frac{4}{3}x^3 + \frac{4}{3}x^5 + \cdots$ **6**

(c) Find constants a, b and c if $\lim_{x \to 0} \frac{ae^x - b\cos x + ce^{-x}}{x \sin x} = \frac{3}{4}$ **8**

Q6(a) Prove that $\log\left[\frac{\cos(x - iy)}{\cos(x + iy)}\right] = 2i \tan^{-1}(\tan x \cdot \tanh y)$ **6**

(b) Find n^{th} derivative of $y = \frac{3x - 4}{(x+2)(x-1)^2}$ **6**

(c) If $u = f(r^2)$, $r^2 = x^2 + y^2 + z^2$, Prove that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 4r^2 f''(r^2) + 6f'(r^2)$ **8**

Q7(a) Find the D .D of x^2y^3z at (3, 1, 2) along the direction of a vector from A (2, 3, 5) to B(3, 1, 6). **6**

(b) Evaluate $\lim_{x \to 0} \frac{e^{2x} - (1+x)^2}{x \log(1+x)}$ **6**

(c) If u is a homogeneous function of degree n in three variables x, y and z, then prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z} = nu$ **8**

F.Y.B.Tech. Sem I - C/M/E.

Engineering Mathematics-I Dt. 04/01/16.

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F.Y.B.Tech. (C/M/E) Sem I.
Engineering Graphics - I.

Library.
6/1/16
Re-exam.

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

Re Exam

January 2016

Max. Marks: 100 Duration: 03 Hours

Class: F.Y. B.Tech. Semester: I Program: C/M/E

Name of the Course: Engineering Graphics I Course Code : BT 103

Master file.

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams.
4. Assume suitable data if necessary.
5. Use First Angle Method of Projection.

Q1(a) The major and minor axis are 120 mm long and 70 mm long respectively. Draw the half of the ellipse by the concentric circle method and other half by rectangle method. 10

(b) Line AB, 50 mm long has its FV and TV length 30 mm and 40 mm respectively. The point A is 10 mm above HP and 15 mm in front of VP while its end B is in the first quadrant. Draw its projection and determine the true inclination of the line AB with HP and VP. 10

Q2(a) The line PQ 100 mm long, is inclined at 30^0 to the HP and 45^0 to the VP. Its mid point is in the VP and 20 mm above the HP. Draw the Projections, if its end P is in the third quadrant and Q is in the first quadrant. 10

(b) Draw an involute of a circle of 60 mm diameter. Also draw the normal and tangent at any point on the curve. 10

Q3(a) A pentagonal plate of 25 mm side has one of its side in the HP. making an angle 45^0 to the VP. Draw its projections if its surface is inclined at 45^0 to the HP. 10

(b) A rectangular plane of 30 mm × 50 mm is resting on one of its corner on VP. with diagonal passing through that corner is inclined to HP at 30^0 and to VP at 45^0. Draw its projections. 10

Q4(a) A regular hexagonal plate of 25 mm side has one of its corner in the HP. The diagonal passing through that corner makes an angle of 30^0 and 45^0 to the HP and the VP respectively. Draw its projections. 10

(b) A $30^0 - 60^0 - 90^0$ set square has its shortest edge 50 mm long and is in the HP. The TV of the set square is an isosceles triangle. Draw projection with the hypotenuse of a set square inclined at 40^0 to the VP. Measure the true inclination of a plane with HP. 10

Q5. A cylinder of 70 mm base diameter and 100 mm length of an axis is resting on its base on the HP. It has a square hole of 35 mm side cut through its flat ends, so that the axis of a hole coincides with the axis of cylinder. The faces of a hole are equally inclined to the VP. It is cut by the cutting plane inclined to the HP and perpendicular to the VP and passing through the extreme left point of the top surface and the extreme right point of the base of a cylinder. Draw the FV, Sectional TV, sectional SV and true shape of the section. 20

F.Y.B.Tech. (C/M/E) Sem I.
Engineering Graphics - I.

Library.
6/1/16
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F.Y.B.Tech. (CC/M/E) Sem I.
Engineering Graphics - I. Dt. 06/01/16.

Q6. A right circular cone having diameter at base 50 mm, axis length 70 mm resting on its base in HP is cut by cutting plane perpendicular to VP and inclined to HP at 45^0 bisect the axis. Draw the Development of Lateral Surface of lower remaining Portion of the cone. 20

Q7(a) A pentagonal pyramid side of base 35 mm and height 70mm rests on its base on the HP with one side of base perpendicular to the VP, such that the true shape of the section is an isosceles triangle of maximum possible base and maximum height. Draw its FV, sectional TV and true shape of section. 10

(b) A tetrahedron PQRS of 45 mm long edges has edge PQ in the HP. The edge RS is inclined at 30^0 and 45^0 to the HP and the VP respectively. Draw its projections. 10

F.Y.B.Tech. (CE/ME) Sem I.
Engineering Graphics - I. Dt. 06/01/16.

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Lib - Re-Exam
11/01/16

F.Y.B.Tech. (CC/M/E) Sem-I.
Communication skills

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar, Andheri (West), Mumbai 400 058

(A Government Aided Autonomous Institute)

Re Examination

Duration: 3 hours | Marks: 100

Course: Communication Skills

Class/Branch: F.Y. B. Tech.CME | Semester: 1

Note:

- **QuestionNo 1 is compulsory.**
- **Out of remaining six attempt any 4**
- Figures to right indicate full marks.
- Answers to all sub-questions should be grouped together.

Master file.

Q. 1.a) "Communication is a process whereby information is encoded, channelled, and sent by a sender to a receiver via a medium and a channel". Discuss this statement with the help of a diagram. Also discuss how a communicator should ensure that he gets the desired action or response if public. **[10]**

Q. 1.b) Identify the barriers in the following situations: **[2]**

i. The Manager of a company wrote to a junior employee stating that his report was 'exaggerated'. The employee assumed that the word must mean something fantastic and thanked the Manager.

ii. The senior executive of a firm was so overcome by feelings during his farewell function that he could not speak a single word.

Q1. c) . Answer the following questions in about 100 words (*any two*):- **[08]**

i. What are the different kinds of space distancing we observe during communication situations?

ii. Give a diagrammatic representation of a business letter in semi-block style.

iii. "Oral communication is natural and spontaneous, written communication requires conscious effort". Elaborate.

Q. 2.a) Write short notes on **any three** of the following: (3x4) **[12]**

i. The role played by gestures in non-verbal communication.

ii. Importance of effective downward communication.

iii. The principles of a claim letter

iv. Barriers to Speaking

Q. 2b) Identify the message, medium, channel and feedback in the following communication situations: **[8]**

i. The Sales Manager presents the sales figures to the General Manager in the form of a powerpoint presentation. The General Manager smiles in appreciation.

ii. A singer performs in a concert. The crowd applauds the performance through a standing ovation.

iii. A computer institute inserts its advertisement in a local newspaper. It receives at least fifteen telephonic enquiries.

iv. A group of actors perform a street play in an inter-collegiate competition on the theme "The

v. Girl-child". The judges praise the play.

Q.3a) Describe a voltmeter with the help of a diagram. **[8]**

OR

Q.3a) Explain the process of galvanizing with the help of a neatly labeled diagram. Also mention its uses in industry and/or elsewhere.

F.Y.B.Tech. (CC/M/E) Sem-I.
Communication skills

Lib - Re-Exam
11/01/16

BHARATIYA VIDYA BHAVAN'S

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Munshi Nagar, Andheri (West), Mumbai 400 058

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Re Examination

Duration: 3 hours Marks: 100

Course: Communication Skills

Class/Branch: F.Y. B. Tech.CME Semester: 1

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Master file.

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F.Y.B.Tech.C C/M/E) Sem-I -
Communication skills. Dt. 11/01/16.

Q.3b) You are the Human Resources Manager in a software company. You believe that the junior employees in your organization need training in communication skills in order to improve their performance and interaction with clients. Write to the CEO of "Evolve" a training agency asking for information on their training programs. Give necessary details and enquire about batch size, duration, faculty remuneration, etc. (Use the modified-block format). **[12]**

Q. 4a) Write a set of instructions on using a printer attached to a computer. **[8]**

Q.4b) You are the Customer Relationship Manager of a popular mall in the suburbs. You have received a complaint from a visitor stating that the salespersons in the Gents Wear Section behaved in a rude and offensive manner to him last week. Write an apology letter to the visitor and offer a compensatory discount voucher that he can use on his next visit. (Use the Complete-block format). **[12]**

Q.5. a) "Hearing is natural. Listening requires efforts". Explain the statement giving reasons for your answer. **[06]**

B. Distinguish between (***any two***):- **[06]**

i. Solicited enquiry and unsolicited enquiry

ii. Body language and Para language

iii Caution and warning

iv. Halo and Horns effect in socio psychological barrier

C. Rearrange the following letter in complete block form: **[08]**
Make necessary corrections in format, language and punctuation and also apply the principles of business correspondence.

Hewlett-Packard Ltd. India
Chandiwala estate, Maa Annadmayi marg, Kalkaji,
N Delhi 110019 Tel: 6626000-29
Fax 6826020

Your ref. 6th Dec,2015
Our ref. DS/MR
DATE:04/01/16

Dear Mr. Singh
Subject: HP office jet proll 50 C

We are very happy to receive your enquiry which is been received today by us. There are many customers like you who make enquiry for our product. I am sending you our catalogue and pricelist for the equipment that you are interested in buying. We also want to bring to your notice that we do not give our equipment on credit basis.

Please look in to our terms and conditions. And for further enquiries call us on our telephone numbers . we are looking forward for a firm order.

Yours faithfully
D Sampson
(sales Manager)
Encl; catalogue and pricelist.

Q.6a). Read the following passage carefully and answer the questions given below: **[07]**

By collecting things, man can give free rein to his inborn greed. Whether the desire to collect is inborn is not, it makes its appearance very early in life. Little boys collect coins, labels, or stamps. Children are more concerned with quantity than with quality. They will proudly say that they have 1000 stamps and go on counting and recounting them like a miser going through his hoards. They even engage in a kind

F.Y.B.Tech.C C/M/E) Sem-I -
Communication skills. Dt. 11/01/16.

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F.Y.B.Tech (CC/M/E) Sem-I.
Communication Skills – Dt. 11/01/16.

of an exchange. Most of us grow out of this tendency; however those who do not, become obsessed with their collection and throughout their lives go on adding to it relentlessly. Those few who have made a successful job of collecting money find new and exciting 'toys' to buy – expensive antiques, rare pictures, and autographed manuscripts replace the coins and stamps of their childhood.

People who claim that they never collect anything often have the biggest collections of all. Tucked away in the dark recesses of their houses, in the attics and cellars, there are masses of junk they would never dream of throwing away. 'You never know when it will come handy', they say as they relegate the broken chair to the attic. And so the collection grows. Tattered, moth-eaten umbrellas, coats, and photographs all find their way there, to join the ancient gramophones and chandeliers.

Collectors, we are told, are useful and instructive. They very often are. But this claim is simply a cover for man's uncontrollable greed – his innate desire to have, to hold, to count, and rarely to look at.

i. In the first sentence the writer says that (1)
   a. Man is born greedy
   b. Man likes to collect things.
   c. By collecting things man proves he is greedy.
   d. By collecting things man can satisfy his need.

ii. Point out the comparison in paragraph 1. (2)

iii. "Most of us grow out of this tendency." What does "this tendency" refer to? (2)

iv. Why, according to the writer, do people store junk in their houses? (2)

6.b. Write a summary of the above passage in not more than 100 words. **[8]**

6.c. Classify the following into precaution, caution, warning, maintenance description and definition. **[05]**

i. Always wear cotton clothes before lightening the crackers.
ii. Keep pressurized spray can away from exposed heat or exposed flame.
iii. Galvanizing is the process of coating iron or steel with tin.
iv. When you chisel, cut away from your body.
v. Do not allow the wash load to stick out from the wash tub.

Q.7. a. Differentiate between formal and informal communication in a business organization along with its limitations. **[08]**

b. Define the following terms: **[04]**

a. Engine b. Voltmeter c. Microscope d. Tool

c. Identify the channels of communication used in the examples given below. **[04]**

i The lecturer submitted their lesson plans to their respective Head of departments

ii The HR manager instructed the staff to work more effectively

iii A top secretary broke the news of a new policy after overhearing a telephone conversation among the top executives.

Iv All heads of the departments of S. K. Industries sat for a discussion to seek a solution to a crucial problem.

d. Correct the following: **[04]**

i Your's Faithfully

ii 23, September 2015

iii Dear Sir: - Your's Sincerely

iv P.S.: please see

F.Y.B.Tech (CE/M/E) Sem-I.
Communication Skills – Dt. 11/01/16.

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i Your's Faithfully
ii 23, September 2015
iii Dear Sir: - Your's Sincerely
iv P.S.: please see

Lib - Re-Exam
11-01-16

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

A.T.K.T exmaination for F.Y.BTech (Civil/Mechanical/Electrical)

2015-16

F.E. (C/M/E) Sem-I.
Applied physics-I.

Total Marks: 50

Duration : $1\frac{1}{2}$ Hours

CLASS/SEM : **F.E. (C/M/E) Sem-I**

SUBJECT : **APPLIED PHYSICS-I**

- Attempt any FIVE questions out of SEVEN questions
- **Answers to all sub questions should be grouped together.**
- Assume suitable data (if necessary) and state the assumption/s clearly.
- Draw diagrams wherever necessary.
- Figures to the right indicate full marks.

Master file.

Good luck!

Q. No.		Mark
1		
(a)	Derive an expression for radii of dark rings in Newton's rings setup in the reflected light.	6
(b)	If the pulse width of a Nd:YAG laser is 25ms and average output power per pulse is 0.8W, how many photons does each pulse contain?	4
2		
(a)	State the expression for intensity when monochromatic light undergoes diffraction from a grating and hence obtain conditions for maxima, minima and secondary maxima.	6
(b)	Energy of a particle at absolute temperature T is of the order of kT. Calculate the wavelength of thermal neutrons at 27°C, given mass of the neutron is 1.6×10^{-27}kg, k=8.6×10^{-5}eV/°K.	4
3		
(a)	Write a note on losses in optical fibers.	6
(b)	An electron is bound by a potential which closely approaches an infinite square well potential of width 2.5×10^{-10}m. Calculate the lowest three permissible quantum energies that the electron can have.	4

(1)

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F.E. (C/M/E) Sem-I
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(1)

F.E. (CIM/E) Sem-I.

Applied physics-I - Dt. 11/01/16.

4		
(a)	Explain uncertainty principle by using diffraction of particles through a single slit.	6
(b)	Output of Ruby laser having aperture 1mm is sent to moon. Calculate (i) angular spread of the beam and (ii) area of spread of the beam when it reaches the moon. Given: distance between earth and moon is $4x10^5$km.	4
5		
(a)	Write a note on Ruby laser.	6
(b)	Draw intensity curve for Single slit diffraction.	4
6		
(a)	Write a short note on holography using lasers.	6
(b)	A step index fiber in air has NA of 0.16, a core refractive index of 1.45 and a core diameter of 60cm. Determine the normalized frequency for the fiber when light at a wavelength of 0.9μm is transmitted.	4
7		
(a)	Using Schrödinger's time independent equation, deduce the energy Eigen values and Eigen functions for a free particle in motion along positive X direction.	6
(b)	A certain optical fiber has an attenuation of 3.5dB/km at 850 mm. If 0.5mW of optical power is initially launched into the fiber, what is the power level in μW after 4km?	4

(2)

F.E. (CC/M/E) sem-I.
Applied physics-I - Dt. 11/01/16.

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Lib – Re-Exam
05-01-16

F.E. (C/M/E) Sem I.
Basic Electrical & Electronics Engg.-I.

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar,Andheri(West),Mumbai 400 058

(A Government Aided Autonomous Institute)

RE-Exam-Jan 2016

Duration: 3 hours Marks: 100

Subject: **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING I**

Class/Branch: FE- (C/M/E) Semester: I

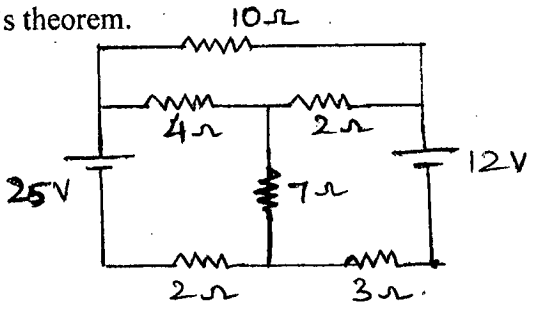
Master file.

Note:

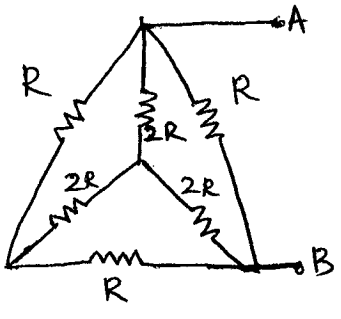
Question no 1 is compulsory
Answer any 4 of the remaining 6 questions
Assume suitable data if required.
Figures to right indicate full marks.
Answers to all sub-questions should be grouped together.

1a	What are the assumptions for an ideal transformer?	4
b.	Derive the condition for maximum power transfer through a network.	4
c.	What is back emf.? State its significance in dc motors.	4
d.	What is the voltage, current and power relation in a balanced star connected load.	4
e.	What is power factor? state its significance.	4

2a Calculate the current through 10 ohm resistor by superposition theorem and verify the same by Thevenin's theorem. 16



b. Find R_{AB} 4



Lib — Re-Exam
05-01-16

F.E. (C/M/E) Sem I
Basic Electrical & Electronics Engg. I

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

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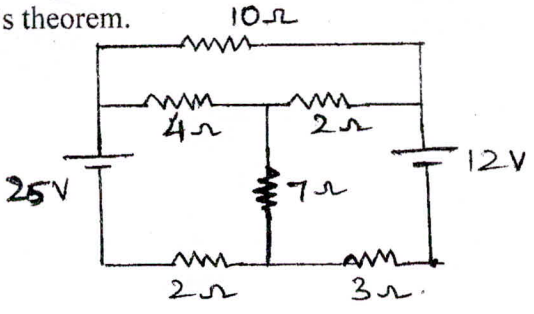

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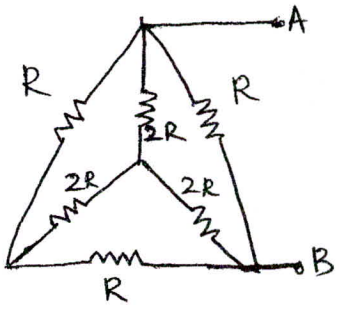
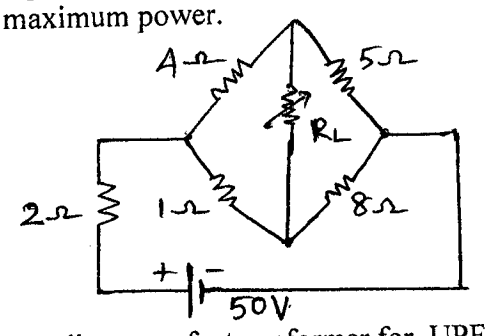


F.E. (CIM/E) Sem I - Dt. 05/01/16.
Basic Electrical & Electronics Engg. I.

3a. For the circuit given below determine R_L for maximum power transfer. Also calculate the maximum power. 10



b. Draw the phasor diagram of a transformer for UPF load and leading PF. 6

c. Define :Line and phase voltage, line and phase current. 4

4a Prove that for a three phase balanced delta connected load, line current is $\sqrt{3}$ times the phase current with neat phasor diagrams. 10

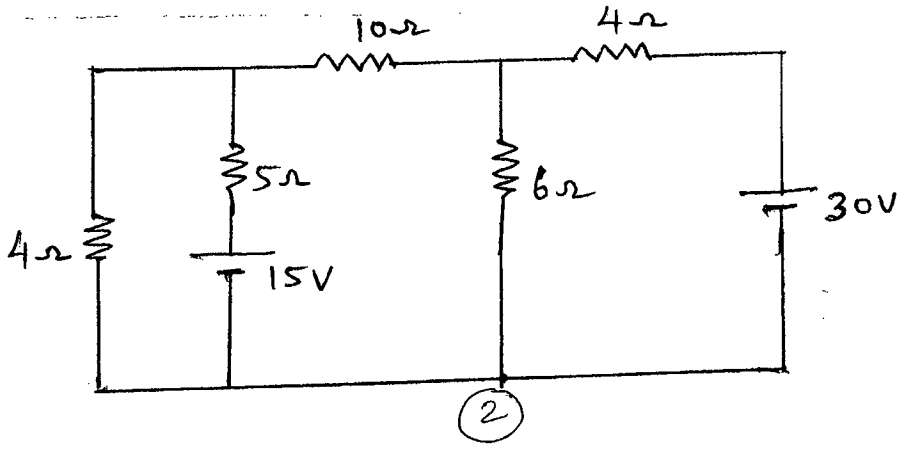
b. In a series parallel circuit two parallel branches A and B are in series with C. The impedances are $Z_A = (10+j8)\Omega$, $Z_B = (9-j6)\Omega$, $Z_C = (3+j2)\Omega$. If the voltage across Z_C is $100\angle 0V$. Determine the values of I_A and I_B. 10

5a With neat circuit diagrams explain the open circuit and short circuit test of a single phase transformer. 10

b. Explain the working principle of a single phase transformer. Derive its emf equation 6

c What are the advantages of a three phase system over single phase system? 4

6a Find the currents through 10ohm resistor by nodal analysis. 8



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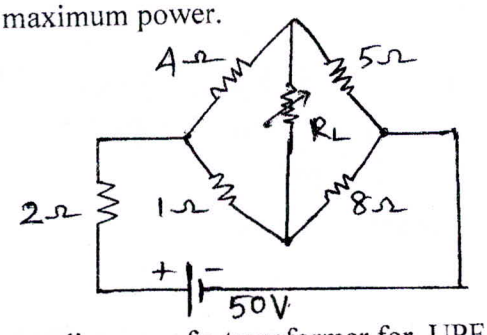

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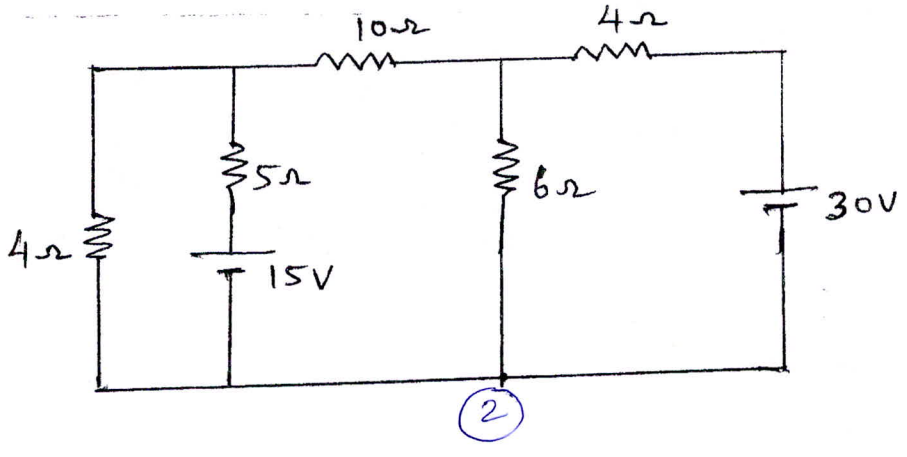

F.E. (C/M/E) Sem I . Dt. 05/01/16.

Basic Electrical & Electronics Engg. I.

b	A current of 5A flows through a non inductive resistance in series with a choking coil when supplied at 250v,50Hz.If the voltage across the resistance is 125V and across the coil is 200V.Calculate the impedance ,reactance and resistance of the coil .	8
c	In a balanced three phase circuit power is measured by two wattmeters and the ratio of two wattmeter readings is 2:1 find the power factor of the system.	4
7a	Explain double field revolving theory in single phase induction motors. Explain types of single phase induction motors with phasor diagram.	10
b .	Explain the working principle of a three phase induction motor. How is rotating magnetic field produced in a three phase induction motor?	10

F.E. (C/M/E) Sem I . Dt. 05/01/16.

Basic Electrical & Electronics Engg. I.

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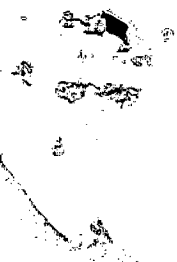

F.Y.B.Tech. Sem I, C/M/E
Communication skills.

Library
20/11/2015

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam
November 2015

Max. Marks: 100 Duration: 3 Hours
Class: C/M/E Semester: I Program: F.Y.B.Tech
Name of the Course: Communication Skills **Course Code : BT107**

Instructions:

1. **Question No 1 is compulsory.**
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. **Answers to all the sub questions should be attempted and grouped together.**

Master file.

Question No		Maximum Marks
Q1 (a)	Write descriptive notes on any two of the following topics in not less than 200 words i) Types and importance of feedback in a communication process ii) Explain the SQ3R techniques to improve reading. ii) Explain the importance of Non-Verbal Communication.	08
(b)	i) Write importance of external communication in a business organization.	04
(c)	i) Write steps to give effective instructions. ii) Write steps to acquiring you attitude and courtesy in a business letter	08
Q2 (a)	You are a publisher located at Delhi. You have received an enquiry regarding supply of Engineering text books from Sardar Patel College of Engineering, Munshi Nagar, Andheri (West), Mumbai – 400058. Draft an attractive and appropriate reply giving details. Provide a price list in the form of quotation. Also offer incentives to make sure you get your order. (**Use Semi-block form**). **Invent necessary details.**	12
(b)	Discuss the paralinguistic aspects of effective oral communication.	05
(c)	State true or false: i) Noise in external environment is a mechanical barrier. ii) One cannot not communicate. iii) Downward communication provides feedback to the supervisor. iv) Pauses during a speech suggest the speaker's lack of confidence. v) The study of communication through touch is known as Chronemics. vi) There are seven basic components of communication.	03
Q3 (a)	Explain any three socio-psychological barriers to communication with examples.	06
(b)	As a Manager of a hotel in Delhi, write a letter to the General Manager of Uttam Potteries Aliganj Road, Khureja telling him that most of the contents of the case of China Ware which you ordered were damaged and are estimating to Rs. 58,200/- approximately. Demand replacement or suitable compensation. (**Use Complete block form) Invent necessary details.**	12
(c)	Do as directed: i) The artist displays his painting about peace at an exhibition and is awarded the first prize. (Identify the sender, message, medium, channel and feedback)	02
Q4 (a)	Discuss the cycle of communication with all components with the help of diagram and suitable examples.	08

F.Y.B.Tech. Sem I, C/M/E
Communication skills.

Library
20/11/2015

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(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam
November 2015

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(c)	Do as directed: i) The artist displays his painting about peace at an exhibition and is awarded the first prize. (Identify the sender, message, medium, channel and feedback)	02
Q4 (a)	Discuss the cycle of communication with all components with the help of diagram and suitable examples.	08

(b)	Write complete set of instructions for any one of the following. Insert safety hazards wherever necessary. i) To make a physiograph ii) Changing the tube of a tube light	06
(c)	i. Mention steps to draft a complaint letter and reply to a complaint ii. Identify the barriers in the following situations: a. A student unable to speak in front of the class even though well prepared with speech. (Semantic barrier, Psychological barrier, Physical barrier) b. A successful businessman not accepting the ideas of a salesman who comes to him with a new product. (Semantic barrier, Socio-cultural barrier, Psychological barrier	04 02
Q5 (a)	Describe any one of the following objects by giving definition, diagram, description and working. i) An Electric Iron ii) A Thermometer	10
(b)	Give a diagrammatic representation of the parts of a letter in Modified block form.	04
(c)	What are the various channels of communication in a business organization? Differentiate between Upward and Downward channels of communication.	06
Q6 (a)	Write a short notes:- i) "We are all born with the ability to speak. We only need to work on it." In the light of the above statement mention steps to become a powerful speaker.	08
(b)	Write 5 points of difference between Oral and Written Communication	03
(c)	i. Explain the importance of Silence and Space Distance in Communication with examples. ii. Define the following: i) A Calculator ii) Spring Balance iii) Caution iv) Microscope	05 04
Q7 (a)	Read the following passage carefully and answer the questions given below: **Terror – Tech** From the ever-evolving computer industry to the introduction and widespread popularity of the internet, from the various electronic gadgets cars to spacecrafts, the world of technology is seemingly endless. Technology is a powerful tool in this modern era, and it has the capability to influence society for its betterment, as well as destruction. Terrorism, by far, is the worst reason for which technology can be utilized; unfortunately, however, technology has helped terrorism to grow by leaps and bounds. It has helped terrorism in both actual and cyber terrorism. It takes only a glance at the complex making and build-up of an explosive or bomb to realize that yes; technology has had a worldwide impact on terrorism. Thus we know that, on one hand, in the long run, terrorism nowadays is based mainly on different types of technology, manufacturing hi-tech gadgets illegally, that too on a daily basis, using the internet as hub to meet, discuss and plan attacks with fellow terrorists breaking (hacking) into government data systems to wreak havoc are only some of the ways in which terrorists utilize technology. Even now, every Indian shudders when the thought of the 26/11 attacks come to mind, when the whole of Mumbai lost many of her loved ones, including army personnel, police officers, women and children. One question, keeps starting at us in the face – "How	

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Q6 (a)	Write a short notes:- i) "We are all born with the ability to speak. We only need to work on it." In the light of the above statement mention steps to become a powerful speaker.	08
(b)	Write 5 points of difference between Oral and Written Communication	03
(c)	i. Explain the importance of Silence and Space Distance in Communication with examples. ii. Define the following: i) A Calculator ii) Spring Balance iii) Caution iv) Microscope	05 04
Q7 (a)	Read the following passage carefully and answer the questions given below: **Terror – Tech** From the ever-evolving computer industry to the introduction and widespread popularity of the internet, from the various electronic gadgets cars to spacecrafts, the world of technology is seemingly endless. Technology is a powerful tool in this modern era, and it has the capability to influence society for its betterment, as well as destruction. Terrorism, by far, is the worst reason for which technology can be utilized; unfortunately, however, technology has helped terrorism to grow by leaps and bounds. It has helped terrorism in both actual and cyber terrorism. It takes only a glance at the complex making and build-up of an explosive or bomb to realize that yes; technology has had a worldwide impact on terrorism. Thus we know that, on one hand, in the long run, terrorism nowadays is based mainly on different types of technology, manufacturing hi-tech gadgets illegally, that too on a daily basis, using the internet as hub to meet, discuss and plan attacks with fellow terrorists breaking (hacking) into government data systems to wreak havoc are only some of the ways in which terrorists utilize technology. Even now, every Indian shudders when the thought of the 26/11 attacks come to mind, when the whole of Mumbai lost many of her loved ones, including army personnel, police officers, women and children. One question, keeps starting at us in the face – "How	

	did a bunch of young boys keep an entire city under siege?" The answer lies only in one word – technology. By using sophisticated weapons and gadgets, even a dozen young boys were able to terrorize us. Another example is of the train blasts that happened in Mumbai few years back. News reports state that the bomb inside the train was activated using a cell phone. Conversely, if advancing technology supports the growth of terrorism, it also means that the government has better ways to defend the country/state against terrorism. Hi-end security measures, such as CCTV cameras, infrared detection, video message regarding solely for the purpose of reporting unidentified / suspicious objects, are all ways in which government can defend the country and combat terrorist by foiling their plans, Bomb-squads, Bullet-proof jackets are many other ways for police and law enforcement officers to fight terrorism effectively. Whether technology affects the future of terrorism in both the aforementioned ways, is quite clear. As technology advances, it will propel the ways and means of terrorism. Nevertheless, it will also enable the government to take better, stringent measures to protect the people against terrorist. It simply is the question of who will prevail first. And that, in its entirety, is a very scary thought. i) Why is technology described as a powerful tool in the passage?-01- ii) How has technology helped terrorism?-01- iii) How do terrorists utilize technology?-02- iv) What are the good uses of technology?-02- v) Give one word for: a) extensively far-reaching b) confusion and destruction -02-	08
(b)	Write a summary of the passage in not more than 175 words.	06
(c)	Give one word substitute for the following; i. One who abstains from alcoholic drinks. T_____ (11) ii. The art of elegant speech or writing. E_____(09) iii. A document written by hand. M_____(10) iv. To heat liquid like milk long enough to kill harmful bacteria. P_____(10) v. Something that is absolutely necessary and cannot be dispensed with. I_____(13) vi. The study of the sounds of a language. P_____(12)	06

END

	did a bunch of young boys keep an entire city under siege?" The answer lies only in one word – technology. By using sophisticated weapons and gadgets, even a dozen young boys were able to terrorize us. Another example is of the train blasts that happened in Mumbai few years back. News reports state that the bomb inside the train was activated using a cell phone. Conversely, if advancing technology supports the growth of terrorism, it also means that the government has better ways to defend the country/state against terrorism. Hi-end security measures, such as CCTV cameras, infrared detection, video message regarding solely for the purpose of reporting unidentified / suspicious objects, are all ways in which government can defend the country and combat terrorist by foiling their plans, Bomb-squads, Bullet-proof jackets are many other ways for police and law enforcement officers to fight terrorism effectively. Whether technology affects the future of terrorism in both the aforementioned ways, is quite clear. As technology advances, it will propel the ways and means of terrorism. Nevertheless, it will also enable the government to take better, stringent measures to protect the people against terrorist. It simply is the question of who will prevail first. And that, in its entirety, is a very scary thought. i) Why is technology described as a powerful tool in the passage?-01- ii) How has technology helped terrorism?-01- iii) How do terrorists utilize technology?-02- iv) What are the good uses of technology?-02- v) Give one word for: a) extensively far-reaching b) confusion and destruction -02-	08
(b)	Write a summary of the passage in not more than 175 words.	06
(c)	Give one word substitute for the following; i. One who abstains from alcoholic drinks. T_____ (11) ii. The art of elegant speech or writing. E_____(09) iii. A document written by hand. M_____(10) iv. To heat liquid like milk long enough to kill harmful bacteria. P_____(10) v. Something that is absolutely necessary and cannot be dispensed with. I_____(13) vi. The study of the sounds of a language. P_____(12)	06

END

F.Y.B.Tech. sem-I, C/M/E.
Communication skills. DJ. 20/11/15

Re.Exam Lib
09-01-16

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE

ANDHERI (WEST), MUMBAI - 400 058.

F.E.(C/IT/E) Sem I.

Subject: Applied Chemistry
Subject Code: BT-106
Time: 3.0 Hours
End Sem-I · ReExam 75 Marks
Note: All questions are compulsory Master file.

Q1 (a)	Explain lime soda process with its advantages and disadvantages	5
(b)	Write difference between BOD and COD	5
(c)	Explain ion exchange Method with advantages	5
Q2 (a)	What are limitation of plain carbon steel	5
(b)	Define Nano Materials and Explain Properties affected with particle Size	5
(c)	Explain application of carbon nano-particles in medicine	5
Q3 (a)	Define Acid value with experimental details and its significance	5
(b)	Explain Physical testing of lubricants with significance	5
(c)	Explain semisolid Lubricants	5
Q4 (a)	Write electrical properties of conducting polymer	5
(b)	Explain N and P type conducting polymer	5
(c)	Write note on liquid crystal polymer	5
Q5 (a)	Define Lubricants and explain its role	5
(b)	Find acid value of 10 gram vegetable oil required 5mL of 0.01 N KOH during the sample titration using phenolphthalein indicator. (Blank titration Reading=0 mL	5
(c)	Convert units 20 ppm = ^{0}Cl, ^{0}Fr, Mg/L and 20 ^{0}Cl = ppm, ^{0}Fr, Mg/L	5

Re.Exam Lib
09-01-16

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE

ANDHERI (WEST), MUMBAI - 400 058.

F.E.(C/IT/E) Sem I.

Subject: Applied Chemistry

Subject Code: BT-106

Time: 3.0 Hours

End Sem-I · ReExam 75 Marks

Note: All questions are compulsory

Master file.

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Re. Exam - Lib
08-01-16

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Re Examination for F.Y.BTech (Civil/Mechanical/Electrical)

2015-16

F.Y. B.Tech. (C/M/E) Sem-I.
Applied physics-I.

08/01/2016

Total marks: **75**

Duration: **3 Hrs**

Class/Sem: **F.Y.BTech (C/M/E) Sem-I**

Subject : **APPLIED PHYSICS-I**
Course code: **BT105**

Master file.

- Question no. 1 is compulsory!
- Attempt any FOUR questions out of remaining SIX questions
- **Answers to all sub questions should be grouped together.**
- Draw diagrams wherever necessary.
- Assume suitable data if necessary.
- Figures to the right indicate full marks.

Good luck!

Q. No.		Max Mark
1	All questions compulsory (5 marks each)	15
(a)	What are Einstein's coefficients? Explain why population inversion is necessary for laser action to take place.	
(b)	A step index fiber has a numerical aperture of 0.16, a core refractive index of 1.45 and core diameter of 90 mm. Calculate: a. Acceptance angle b. Refractive index of the cladding.	
(c)	Explain properties of wedge shaped fringes.	
	Answer any four	
2		
(a)	Explain the formation of Newton's rings and show that the radii of the bright rings are proportional to the root of odd natural numbers.	6
(b)	A 0.1 W He-Ne laser with an aperture of 5mm emits light. Calculate the areal spread and intensity of the image when the beam is focused with a lens having focal length 100mm.	3
(c)	Deduce Schrödinger's time independent equation, from its time dependent form.	6

(1)

Re. Exam - Lib
08-01-16

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Re Examination for F.Y.BTech (Civil/Mechanical/Electrical)

2015-16

F.Y. B.Tech. (C/M/E) Sem-I.
Applied physics- I.

08/01/2016

Total marks: **75**

Duration: **3 Hrs**

Class/Sem: **F.Y.BTech (C/M/E) Sem-I**

Subject : **APPLIED PHYSICS-I**
Course code: **BT105**

Master file.

- Question no. 1 is compulsory!
- Attempt any FOUR questions out of remaining SIX questions
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F.Y.B.Tech.(CC/M/E) Sem-I.
Applied physics-I- Pt. 08/01/16.

3		
(a)	Write a note on CO_2 laser by giving details about its construction and pumping scheme.	6
(b)	A diffraction phenomenon is observed using a double slit illuminated with light of λ=5000A°. The slit width is 0.02mm and spacing between the slits is 0.10mm. Distance of screen from the slits is 100cm. Calculate: Distance between any two consecutive double slit dark fringes	4
(c)	Derive an expression for path difference in thin films of equal thickness in reflected light and hence state the conditions of constructive and destructive interference.	5
4		
(a)	Differentiate between Single mode and multimode fibres and STIN and GRIN fibres.	6
(b)	A thin film, with a thickness of 272.7nm and with air on both sides is illuminated with a beam of white light normally. In the light reflected by the film, light with a wavelength of 600 nm undergoes fully constructive interference. At what wavelength does the reflected light undergo fully destructive interference?	4
(c)	A laser beam can be focused on an area equal to the square of its wavelength. If a Nd:YAG laser radiates energy at the ratio of 1mW, find intensity of the focused beam and mode separation in terms of frequency if length of the laser is 0.5m.	5
5		
(a)	Explain the concept of wave group and hence the concept of group velocity. Prove Heisenberg's uncertainty principle of position and momentum using this concept.	6
(b)	Attenuation of light in optical fiber is 2.2dB/km. What fraction of initial intensity will remain after 2km and 6km?	4
(c)	State the intensity expression for an double slit Fraunhofer diffraction and hence draw intensity distribution curve for b=a.	5
6		
(a)	Derive an expression for intensity when Fraunhofer diffraction takes place through a single slit.	6
(b)	Prove that electron cannot have a defined trajectory in an atom using Heisenberg's uncertainty principle.	4
(c)	Derive an expression for radii of bright rings in Newton's rings in the reflected system.	5
7		
(a)	Explain the construction and reconstruction methods of Holography using LASERs	6
(b)	The position and momentum of a 1keV electron are simultaneously measured, if the position is located within 1A°, what is the percentage of uncertainty in momentum?	4
(c)	Explain what happens to the intensity distribution curve when (i) a is increased keeping b constant and b is increased keeping a constant in double slit diffraction setup, (ii) the grating element value is increased in N slit diffraction setup.	5

F.Y.B.Tech.(CC/M/E) Sem-I.
Applied physics-I- Pt. 08/01/16.

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F.Y.B.Tech. C(I/M/E) Sem I. Lib - 07-01-16 Re.Exam
Engineering Mechanics.

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks: 100 Duration: 3 Hours

Class: F.Y.Btech. Civil/Electrical/Mehanical Semester: I Program: B.Tech.

Name of the Course: Engineering Mechanics Course Code :

Master file.

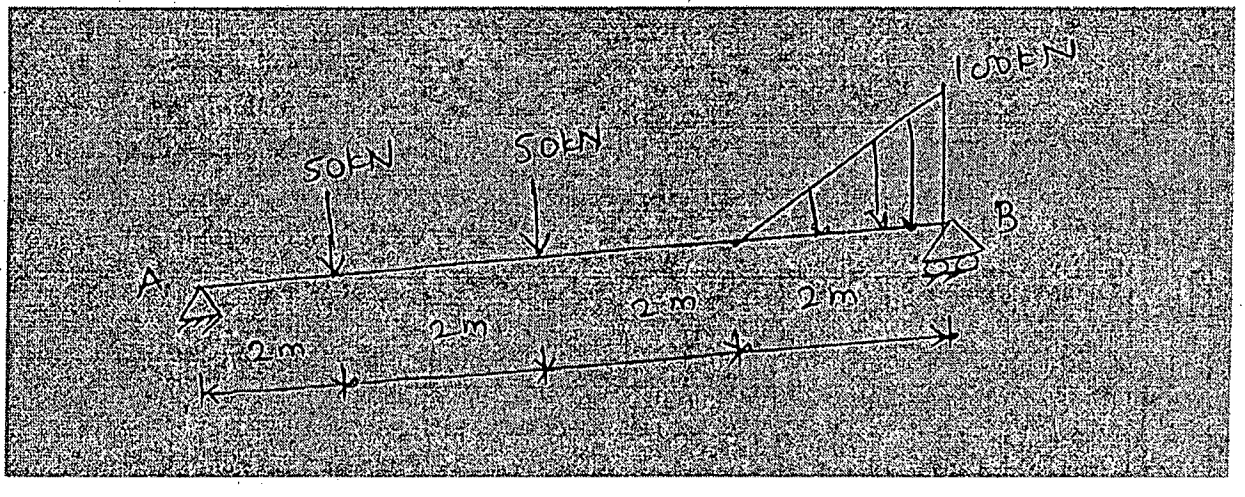
Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

Q1(a) If two coplanar forces with magnitudes 1000 N and 1500 N with are acting on a body with angle of 60 degrees between them. What is the resultant and the angle made by it with the force 1000 N. 4

(b) State and prove Varignon's theorem. 8

(c) Analyze the rigid beam as shown in the figure and find out vertical support reactions. 8



Q2(a) As shown in figure the weight of the ladder is 200 N. External weight (acting downwards) has been applied at 4 m from lower point. (Distance is measured along the ladder.) If the ladder is at critical position, then find out coefficient of friction (μ) for both surfaces. 1

F.Y.B.Tech. CC/M/E) Sem I. Lib
Engineering Mechanics. 07-01-16 Re. Exam

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks: 100 Duration: 3 Hours

Class: F.Y.Btech. Civil/Electrical/Mehanical Semester: I Program: B.Tech.

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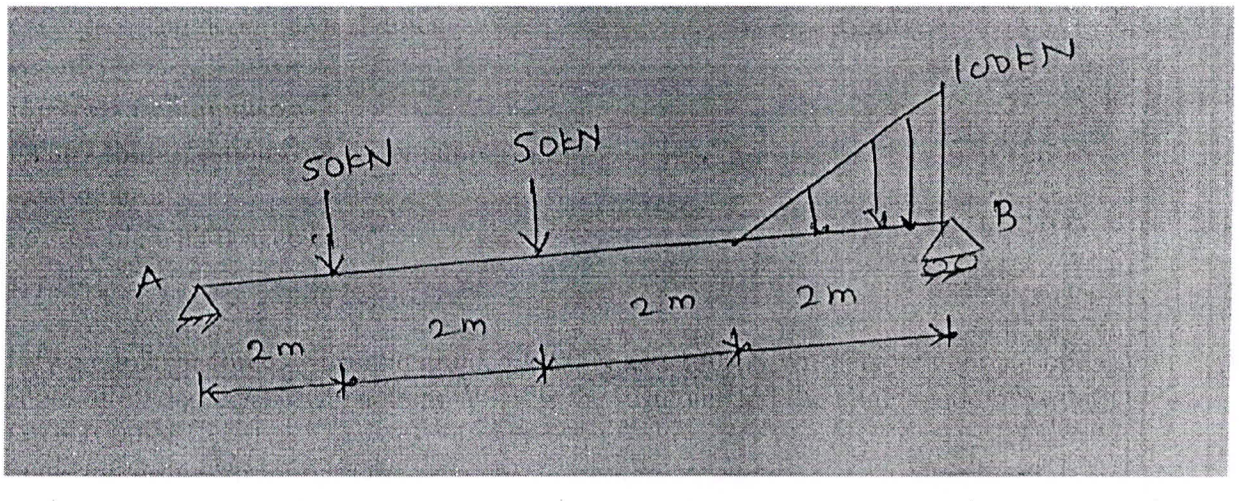

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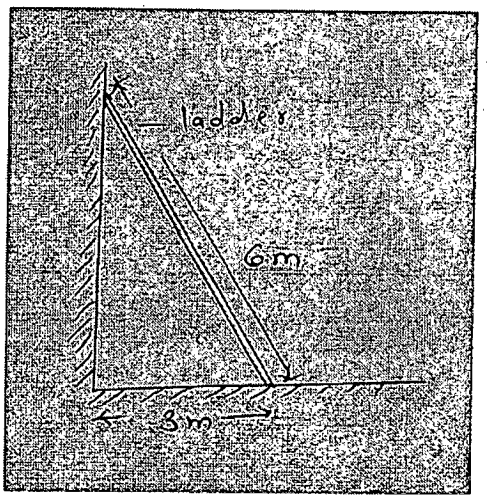
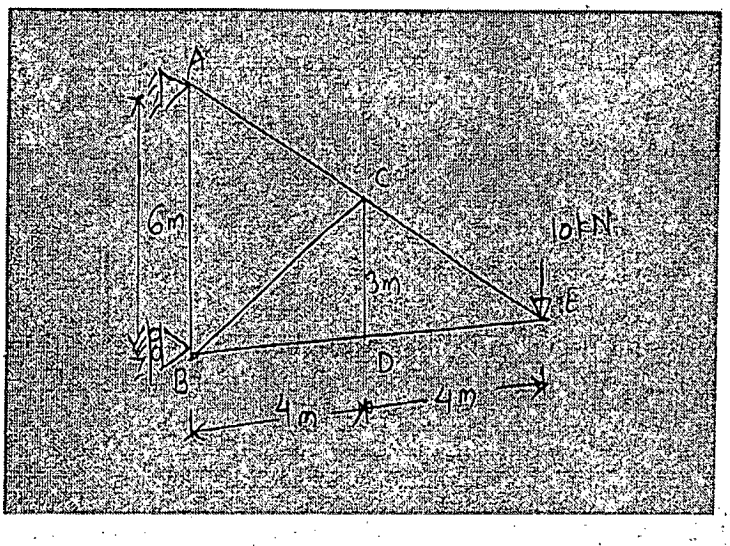
F.Y.B.Tech.(C/M/E) sem I · D1 · 07/01/16.
Engineering Mechanics.

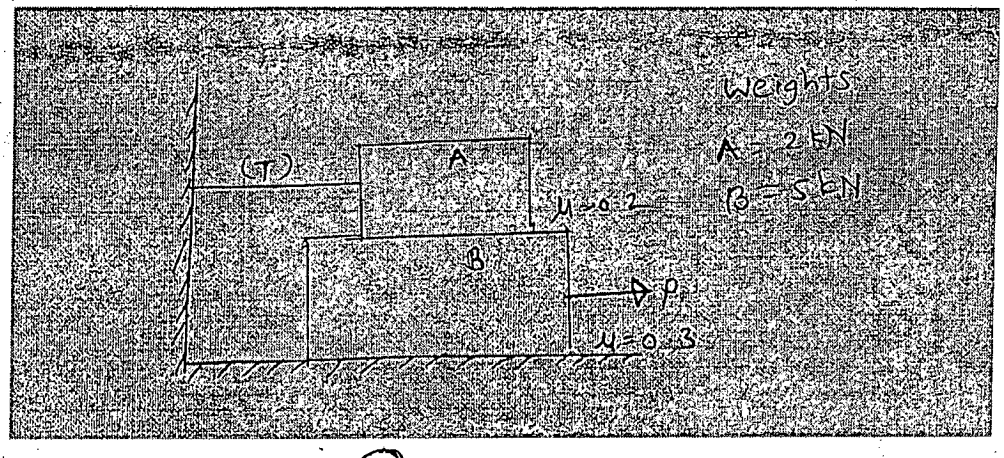


(b) Find the force vector if force of magnitude 100 kN is directing from A(1,1,1) to B(2,2,2). Find out moment developed by the above force about a line in YZ plane making an angle 30 degrees with Y axis. 1

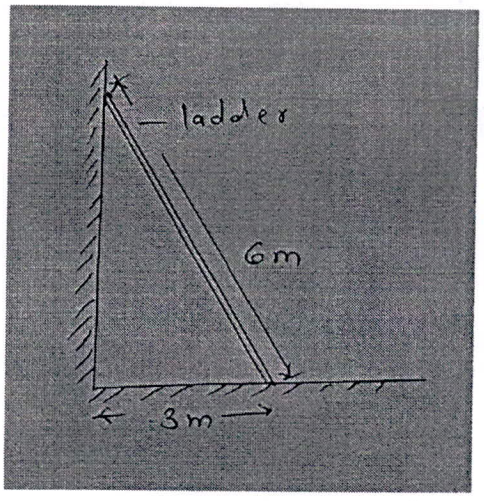
Q3(a) Find forces in all members of the truss shown in the figure. 1



(b) Find the minimum force P which will make block B to move. 8



F.Y.B.Tech.(CIM/E) sem I · D1. 07/01/16.
Engineering Mechanics.



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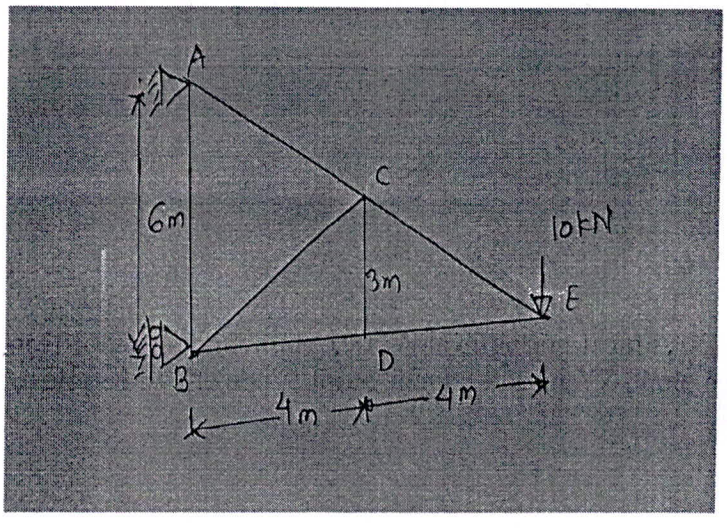

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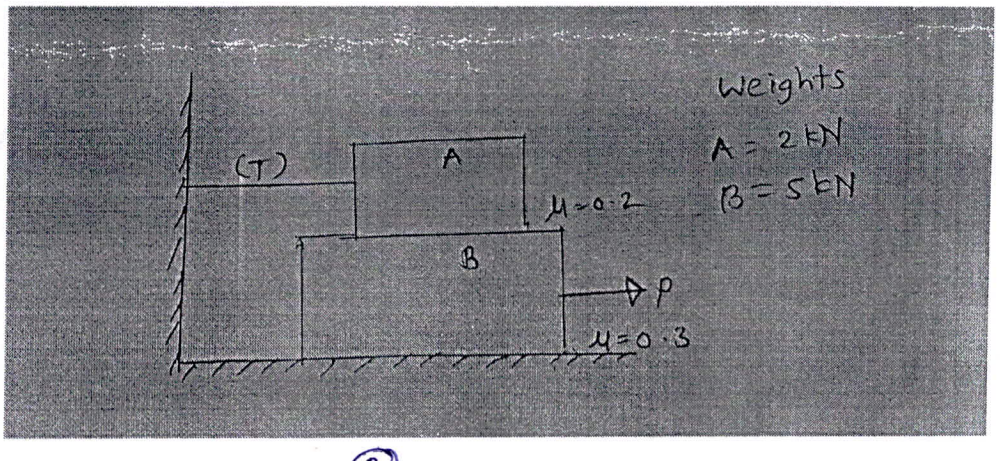

Lib – Re Exam
11-01-16

Bhartiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous College Affiliated to University of Mumbai)

RE-EXAM – JANUARY 2016

Class: F.E. C/M/E
Subject: Engineering Graphics II

Total Marks: 100
Time: 3 Hrs

Note:
1. Assume suitable data if necessary and clearly indicate the same.
2. Figures to right indicate full marks.
3. Save your work regularly.

Seat number	
Reg. No.	
Machine No.	
Sign of Invigilator	

F.E. (C/M/E) Sem I
Engineering Graphics - II.
Master file.

Q1a	Draw the following orthographic projection views of **Figure 1A**	
	a) Front View	10
	b) Top View	08
	c) Left Hand Side View	07
	OR	
Q1b	Draw the following orthographic projection views of **Figure 1B**	
	a) Front View	10
	b) Top View	08
	c) Right Hand Side View	07

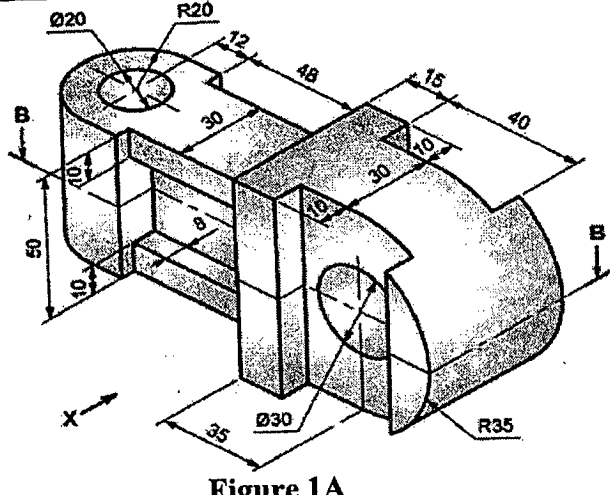

Figure 1A

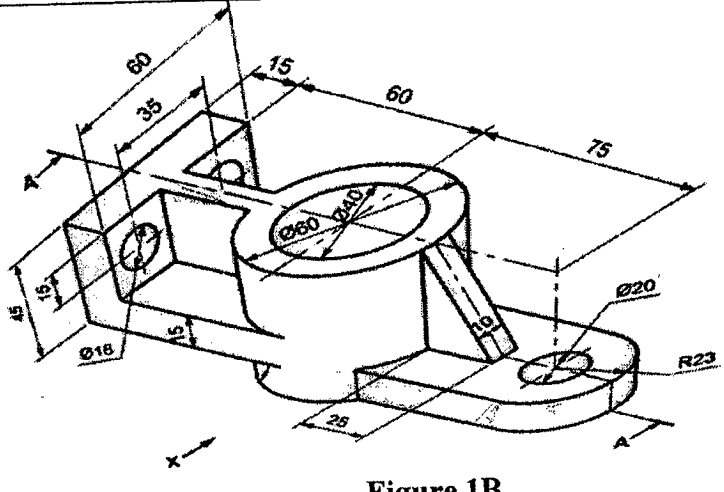

Figure 1B

Q2a	Draw the following views of **Figure 2A**	
	a) Sectional Front View along A-A	10
	b) Top View	08
	c) Right Hand Side View	07
	OR	
Q2b	Draw the following of **Figure 2B**	
	a) Front View	10
	b) Top View	08
	c) Sectional Left Hand Side View along A-A	07
Q3a	1) Draw Isometric View for **Figure 3A**	20
	2) Draw two views of Hexagonal Nut.	05
	OR	
Q3b	1) Draw Isometric View for **Figure 3B**	20
	2) Draw two views of Hexagonal Headed Bolt.	05

Pg 1/2

Lib – Re Exam
11-01-16

Bhartiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous College Affiliated to University of Mumbai)

RE-EXAM – JANUARY 2016

Class: F.E. C/M/E
Subject: Engineering Graphics II

Total Marks: 100
Time: 3 Hrs

Note:
1. Assume suitable data if necessary and clearly indicate the same.
2. Figures to right indicate full marks.
3. Save your work regularly.

Seat number	
Reg. No.	
Machine No.	
Sign of Invigilator	

F.E. (C/M/E) Sem I
Engineering Graphics - II
Master file.

Q1a	Draw the following orthographic projection views of **Figure 1A**	
	a) Front View	10
	b) Top View	08
	c) Left Hand Side View	07
	OR	
Q1b	Draw the following orthographic projection views of **Figure 1B**	
	a) Front View	10
	b) Top View	08
	c) Right Hand Side View	07

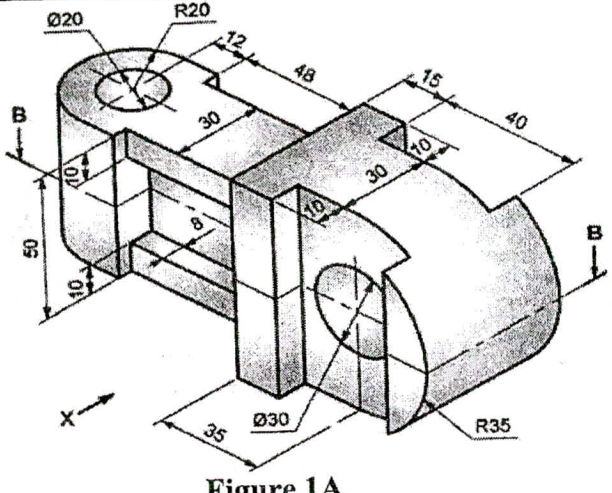

Figure 1A

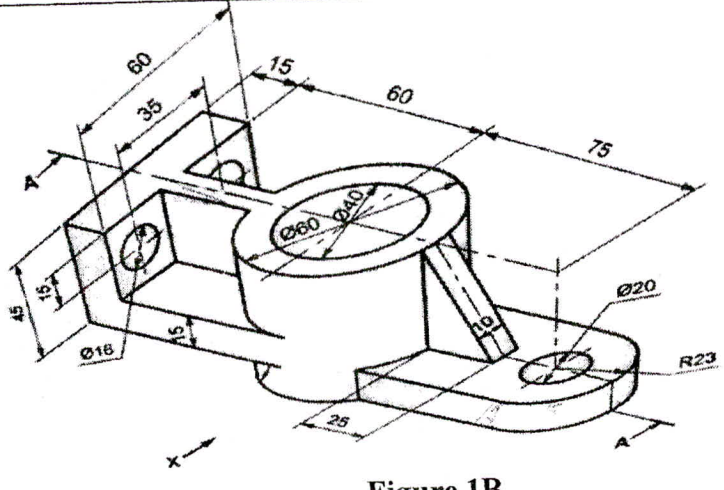

Figure 1B

Q2a	Draw the following views of **Figure 2A**	
	a) Sectional Front View along A-A	10
	b) Top View	08
	c) Right Hand Side View	07
	OR	
Q2b	Draw the following of **Figure 2B**	
	a) Front View	10
	b) Top View	08
	c) Sectional Left Hand Side View along A-A	07
Q3a	1) Draw Isometric View for **Figure 3A**	20
	2) Draw two views of Hexagonal Nut.	05
	OR	
Q3b	1) Draw Isometric View for **Figure 3B**	20
	2) Draw two views of Hexagonal Headed Bolt.	05

Pg 1/2

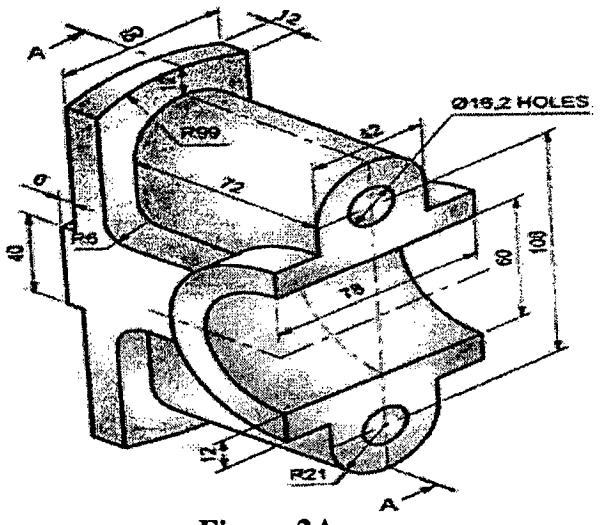

Figure 2A

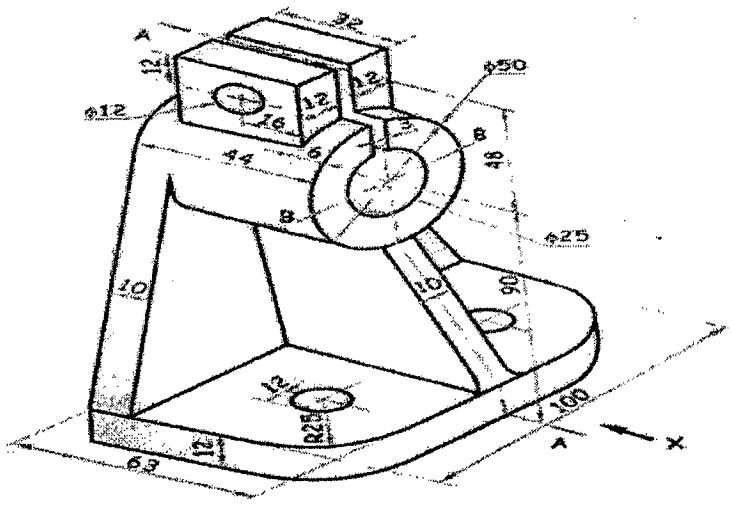

Figure 2B

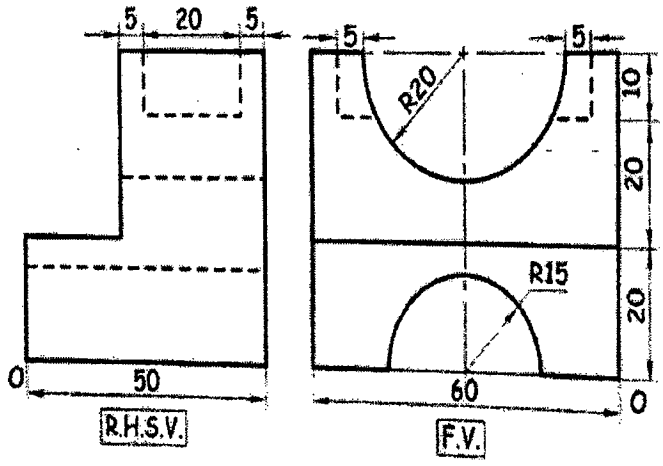

Figure 3A

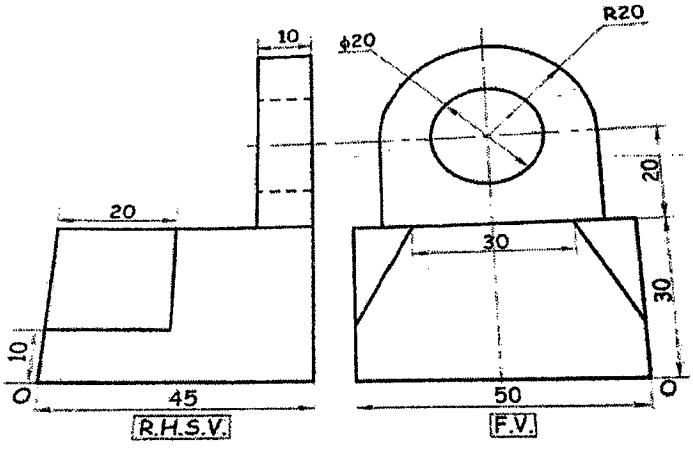

Figure 3B

Q4a	1) Draw the following Views for **Figure 4A**	
	a) Front View	05
	b) Top View	05
	c) Right Hand Side View (Missing View)	10
	2) Draw any two types of Studs	05
	OR	
Q4b	1) Draw the following Views for **Figure 4B**	
	a) Front View	05
	b) Top View (Missing View)	10
	c) Left Hand Side View	05
	2) Draw any two types of Screws	05

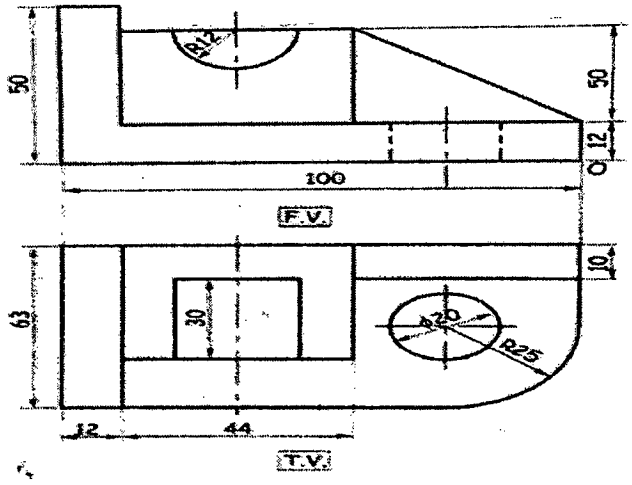

Figure 4A

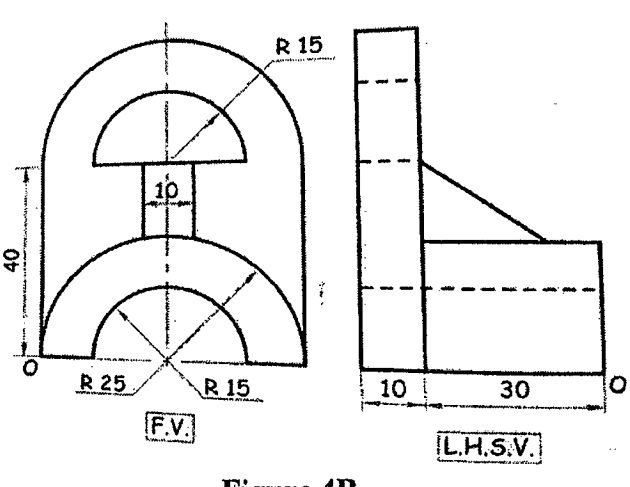

Figure 4B

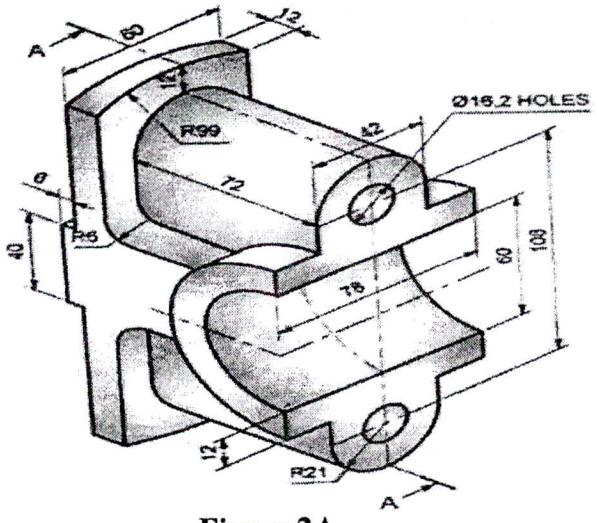

Figure 2A

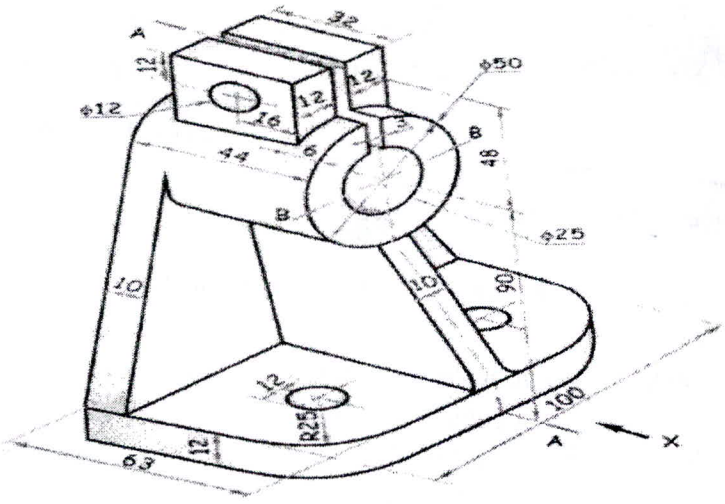

Figure 2B

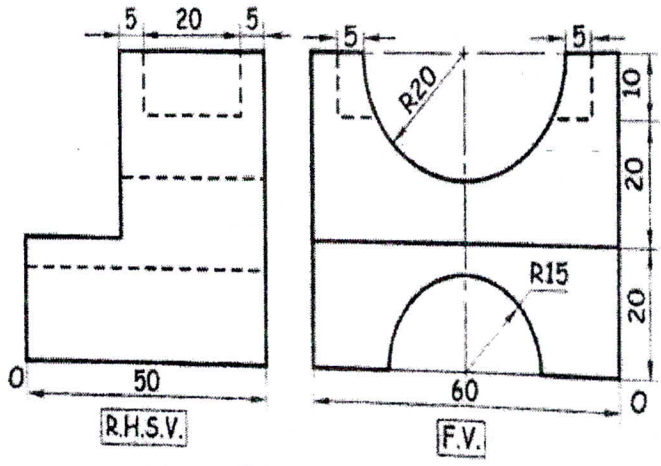

Figure 3A

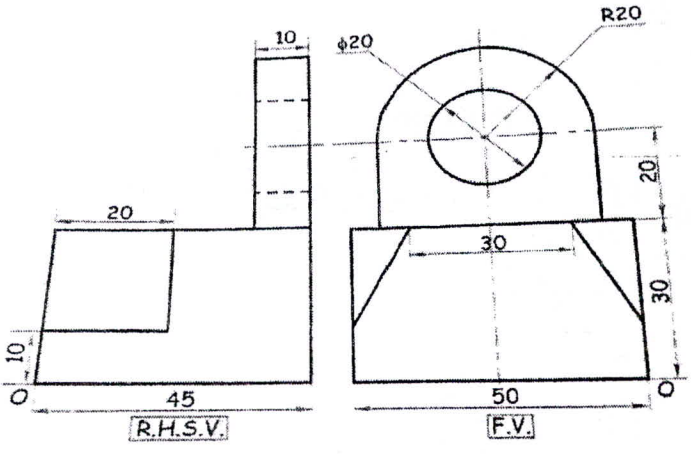

Figure 3B

Q4a	1) Draw the following Views for **Figure 4A**	
	a) Front View	05
	b) Top View	05
	c) Right Hand Side View (Missing View)	10
	2) Draw any two types of Studs	05
	OR	
Q4b	1) Draw the following Views for **Figure 4B**	
	a) Front View	05
	b) Top View (Missing View)	10
	c) Left Hand Side View	05
	2) Draw any two types of Screws	05

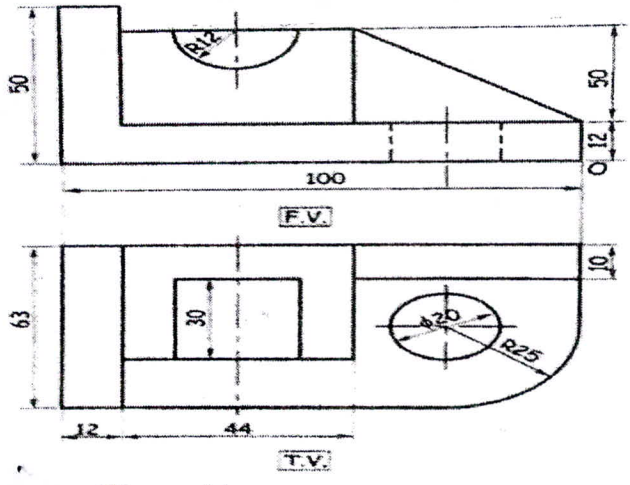

Figure 4A

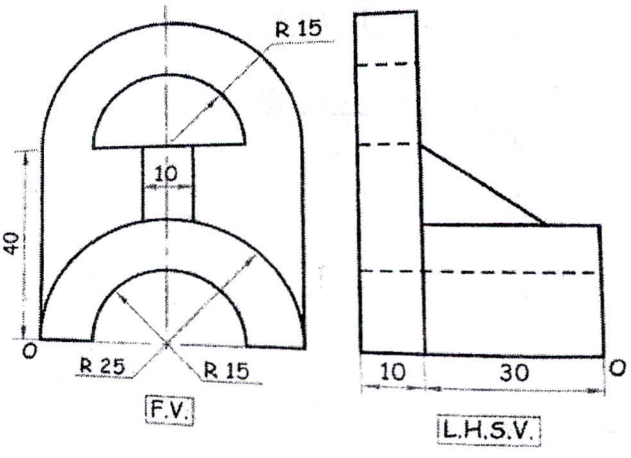

Figure 4B

BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

GOVERNMENT AIDED AUTONOMOUS INSTITUTE

ANDHERI (WEST), MUMBAI - 400 058.

Subject:	Applied Chemistry
Subject Code:	BT-106
Time:	3.0 Hours
End Sem-I – KT Exam	50 Marks

Note: All questions are compulsory

Q1 (a)	Explain Reverse osmosis and its application	**5**
(b)	Write difference between BOD and COD	**5**
(c)	Define saponification value with experimental details and its significance	**5**
Q2 (a)	Define Lubricants and explain its role	**5**
(b)	Explain Physical testing of lubricants with significance	**5**
(c)	Explain semisolid Lubricants	**5**
Q3 (a)	Write electrical properties of conducting polymer	**5**
(b)	Explain N and P type conducting polymer	**5**
(c)	Find acid value of 10 gram vegetable oil required 2.0 mL of 0.01 N KOH during the sample titration using phenolphthalein indicator. (Blank titration Reading=0 mL)	**5**
(d)	Convert units 50 ppm = ^{0}Cl, ^{0}Fr, Mg/L and 30 ^{0}Cl = ppm, ^{0}Fr, Mg/L	**5**

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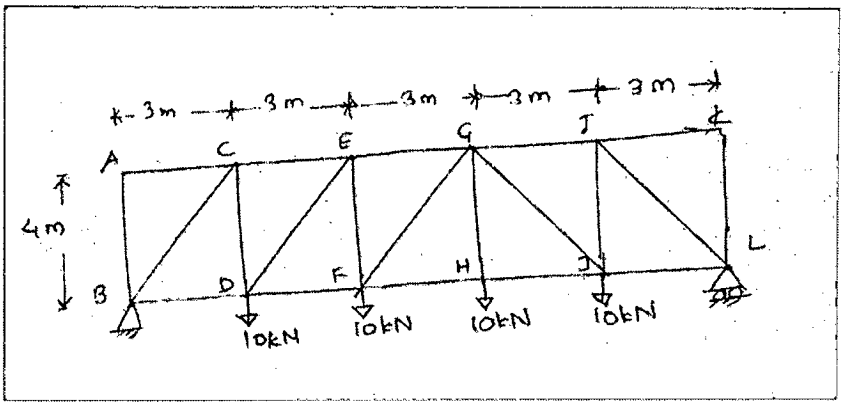
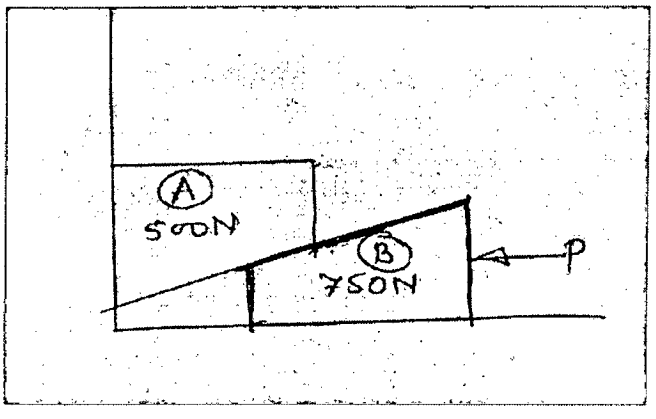
F.Y.B.Tech. (C/M/E) Sem I.
Engineering Mechanics - Dt. 07/01/16.

Q4(a) Find forces in members CE, DE and DF by method of section.

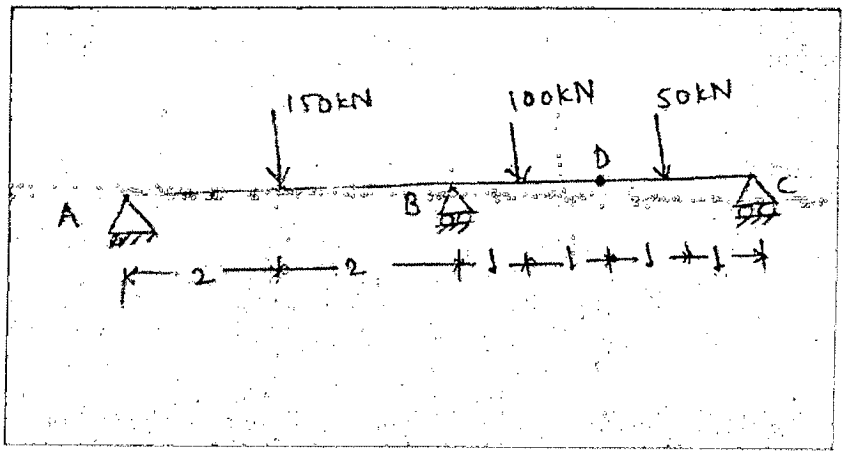


(b) For the arrangement shown in the figure $\mu = 0.25$ for all surfaces. Find minimum force **P** required to lift the block **A.** The weight of the block A is 500 N and the weight of the block B is 750 N. 1



Q5(a) What are the assumptions made in truss theory? 5

(b) Find the vertical support reactions for the beam shown in the figure by **Virtual Work Method only.** 1



Q6(a) Find minimum tension **T** that has to be applied at the point shown in the figure to lift the weight of 50 kN. 8

(3)

F.Y.B.Tech. (C/M/E) Sem I.
Engineering Mechanics - Dt. 07/01/16.

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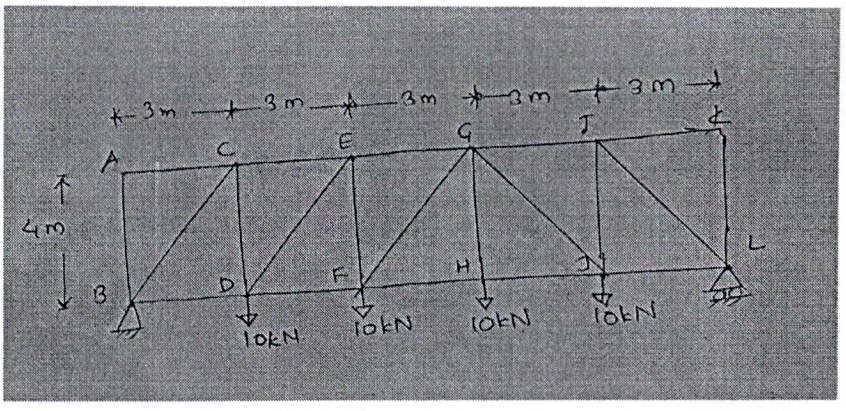

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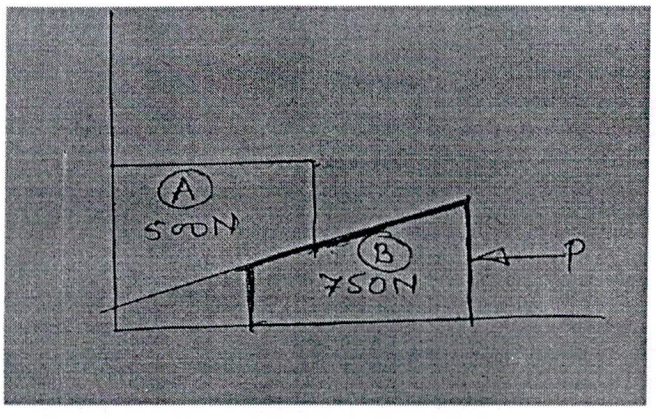

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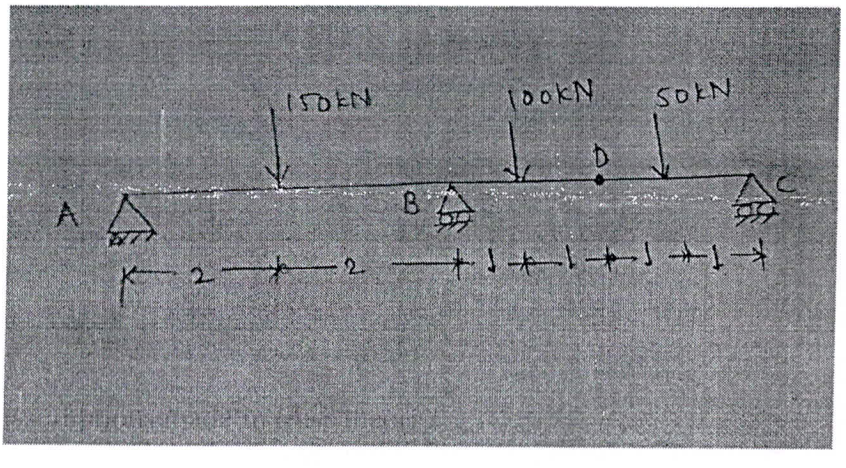

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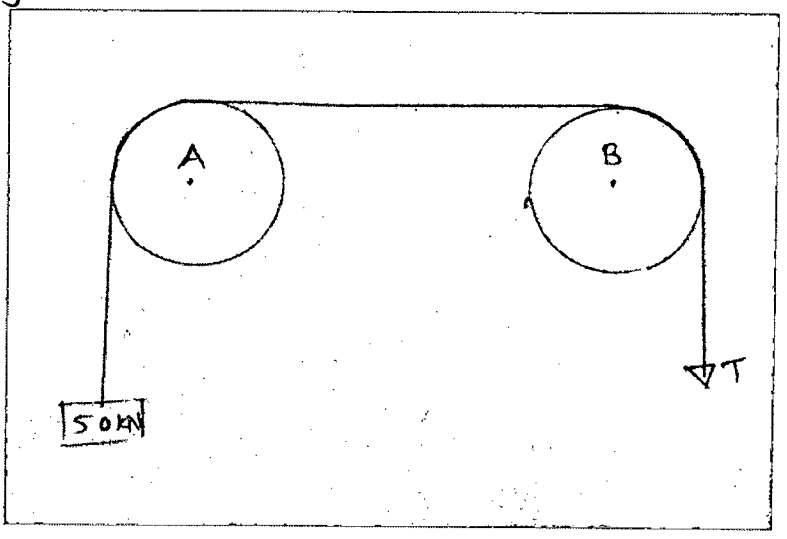
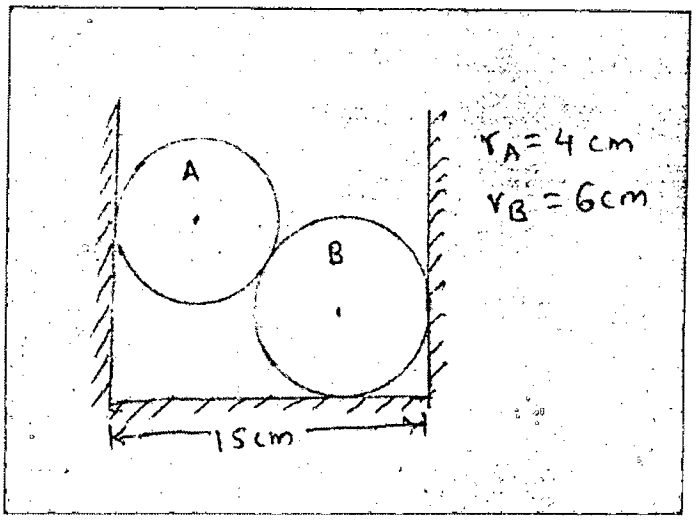


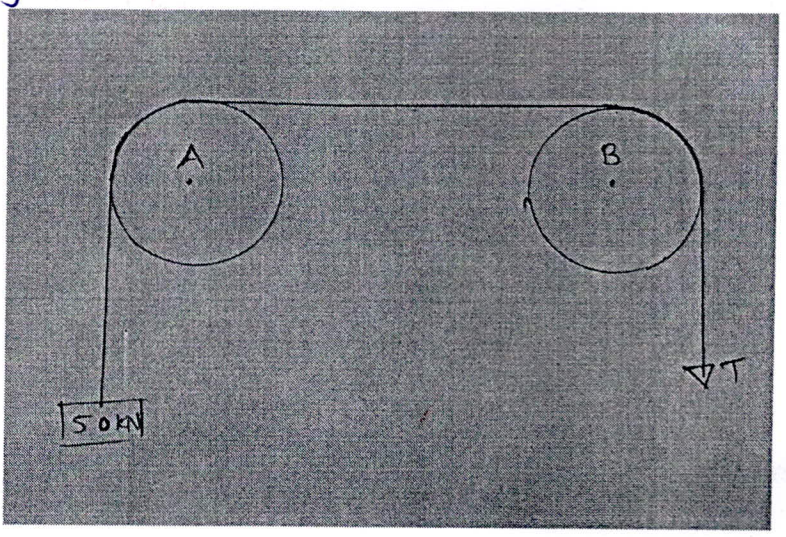
(b) The arrangement shown in figure is at equilibrium. Find vertical reaction made by the floor on the cylinder **B.**



Q7(a) What are two force principle and three force principle? 6

(b) A force of 50 kN is acting from A to B, force of 100 kN is acting from B to C, force of 150 kN is acting from C to D and force of 200 kN is acting from D to A. Where, A (0,0,0). B(0,2,0), C(2,0,0) and D(0,0,2). What is the resultant of this spatial force system? 1

F.Y.B.Tech. (C/M/E) Sem I.
Engineering Mechanics - Dt. 07/01/16



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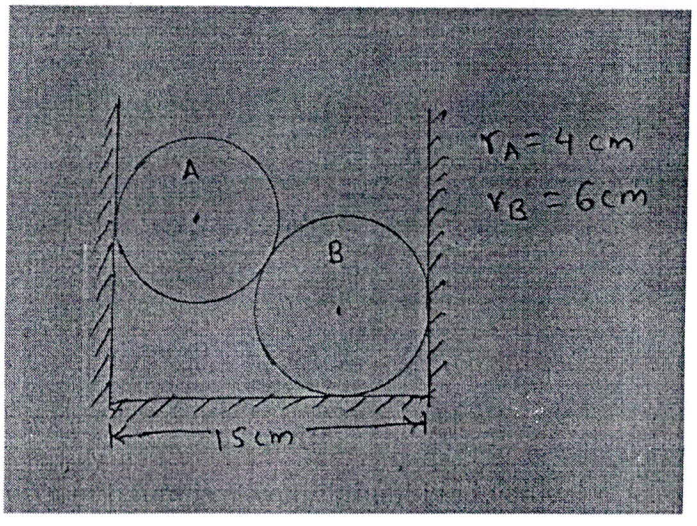

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