



Bharatiya Vidya Bhavan's



Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

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

End Semester Exam

May 2026

Communication Skills

18/5/26

Max. Marks: 100

Hours

Class: F.Y. B. Tech (CME)

Tech

Course Code: AE BT 201

First Year B. Tech
Civil

Semester: II

Sem - II

Duration: 3

Program: B.

NOTE:

- Question number One is compulsory.
- Out of remaining Six questions attempt any four
- Please write subsections of questions in a sequence
- Draw diagrams and charts wherever necessary

Sr.No	Questions	Points	CO	BL
Q.1. A	Evaluate the effectiveness of formal and informal channels of communication in a business organisation. discuss the advantages, limitations, of Horizontal channel of communication.	12	02	01
Q.1.B	Short Notes on any ONE a. AIDA principles of sales letter with examples b. Socio-psychological barriers to communication c. Listening Skills - Discuss barriers, and types of Listening skills and strategies to improve listening skills	08	02	02
Q.2.A	Explain the basic characteristics of Communication Briefly explain the Johari Window model of effective communication theory Highlight its relevance to modern organisational communication.	12	03	03
Q.2.B	Explain the principles of business correspondence in detail	08	02	01
Q.3.A	An educational institute, Bright Future Academy, 121 B lane, Samarth Nagar, Bangalore has written to your company enquiring	12		

	about ergonomic benches for their classrooms. They are particularly interested in the design features that support student posture and comfort, durability and maintenance requirements, pricing and bulk order discounts, delivery timelines and installation support. As the Sales Manager of Edu Furn Solutions Pvt. Ltd., Draft a formal reply letter to the enquiry. Your letter should convert the reply into an order. Invent Necessary details. (Use Semi block Form)			
Q.3.B	"Reading is Learning from an absent teacher". In view of the above explain the importance of reading, the barriers affecting reading skills and elaborate on the Mind mapping and Eye training to improve reading.	08		
Q.4. A.	You are a first-year student of <i>sardar Patel college of Engineering</i> . As per the requirement of NEP every student has to complete a 15 days internship in their respective field of interest. The First Year Head of Department has asked each branch to draft a formal email to potential companies/ Institutes/ Start-ups. Draft a formal email enquiring about internship opportunities. Please keep the principal in CC.	12		
Q.4. B	Draw the Complete block format mentioning the compulsory and optional parts of the letter.	08		
Q.5.A	Describe with quotes the importance of non-verbal communication in business interactions. Explain in detail the aspects of Body language in effective communication.	12	04	05
Q.5.B	Case Study A German engineering firm is collaborating with an Indian IT company on a smart manufacturing project. During a virtual meeting: - The German project lead uses highly technical jargon and abbreviations (e.g., "MES," "SCADA," "Kanban loops"), which confuse some Indian team members unfamiliar with these terms. - The video call suffers from poor connectivity, causing delays and distorted audio. - The German team expects punctuality and strict adherence to agenda, while the Indian team members occasionally join late and prefer a more flexible discussion style. - One Indian engineer uses humor and casual phrases like	08	04	05

	"chalta hai" (it's okay), which the German team interprets as lack of seriousness. Questions: 1. Identify the semantic barriers in this case. 01 2. Identify the physical barriers in this case. 01 3. Identify the cultural barriers in this case. 02 4. Explain how these barriers interact to worsen miscommunication. 02 5. Suggest strategies to overcome at least two of these barriers. 02			
Q.6.A	You are the Purchase Officer at <i>Bright Future Academy</i>. Last month, your institute ordered 50 ergonomic benches from <i>Paras solutions Ltd.</i> for classroom use. After delivery, you noticed several issues, few benches have uneven legs, making them unstable. The promised lumbar support feature is missing in many units. Some benches arrived with scratches and chipped edges. The delivery was delayed by two weeks, causing inconvenience during the new semester. Draft a formal complaint letter to the Customer Service Manager of <i>Paras Solutions Pvt Ltd.</i> Asking for fair compensation for the damaged items. (Use Complete Block Form).	12	04	01
Q.6.B	Describe the importance of Grapevine in an organisation. Explain the advantages and limitations of Grapevine communication.	08		
Q.7. A	"Spoken Words wields great Power". In the context of this statement, elucidate the importance of speaking skills and the barriers to speaking. Describe strategies for effective public speaking.	12		
Q.7. B.	Explain the process of communication and its elements. Why is Communication skills important for engineers.	08		



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END SEMESTER EXAMINATION MAY 2026 / ~~RE-EXAM~~ JULY 2026

Program: Civil/Mechanical/Electrical

First Year B.Tech

Duration: 3 hours

Course Code: BS-BTC201/BTM201/BTE201

Civil

Maximum Points: 100

Course Name: ICDN

Sem - II

Semester: II

1. Use of non-programmable calculator is allowed
2. All questions are compulsory

20/05/26

Q.No.	Questions	Points	CO	BL	Modu No.
1a)	Find length length of the loop of the curve $3ay^2 = x(x-a)^2$	06	3	3,4,5	3
1b)	Prove that : $\int_0^{\infty} \sqrt{t} e^{-t^2} dt \cdot \int_0^{\infty} \frac{e^{-t^2}}{\sqrt{t}} dt = \frac{\pi}{2\sqrt{2}}$	06	3	2,4,5	s.s
1c)	Evaluate $\iiint \frac{1}{(1+x+y+z)^3} dx dy dz$ over the volume of the tetrahedron $x=0, y=0, z=0, x+y+z=1$	08	3	3,4,5	5
2a)	Evaluate $\iint xy dx dy$ over the region bounded by the x-axis, ordinate $x=2a$ and parabola $x^2=4ay$.	06	3	2,4,5	4
2b)	Find the area of the cardioid $r = a(1 + \cos \theta)$	06	2	3,4,5	5
2c)	Solve $\left(\frac{\log y - 1}{\sqrt{x^2 + 1}} + x^2 \right) dx + \frac{1}{y} \log(x + \sqrt{x^2 + 1}) dy = 0$. (given $y > 0$)	08	1	2,4,5	1
3a)	Solve $(1 + y^2) dx = (e^{\tan^{-1} y} - x) dy$	06	1	2,4,5	1
3b)	Change to polar coordinates and evaluate $\int_0^1 \int_0^x (x+y) dy dx$.	06	2	4,5	3
3c)	solve $(2x+1)^2 \frac{d^2 y}{dx^2} - 2(2x+1) \frac{dy}{dx} - 12y = 6x$	08	2	2,4,5	2



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END SEMESTER EXAMINATION MAY 2026 / ~~RE - EXAM~~ JULY 2026

4a)	Prove that $\int_0^1 \frac{x^{3/2}}{\sqrt{3-x}} dx \int_0^1 \frac{1}{\sqrt{1-x^{1/4}}} dx = \frac{432\pi}{35}$	06	3	2,4,5	s.s
4b)	Find the mass of lamina founded by the curve in $y^2 = ax, x^2 = ay$ where density of the lamina at any point varies as the square of its distance from the origin.	06	3	3,4,5	5
4c)	If $\frac{dy}{dx} = y - x$ and $y(0) = 2$ then using Taylor's series find y at $x = 0.4$. Compare the result with exact solution.	08	1	1,4,5	1
5a)	Change the order of integration $\int_0^4 \left\{ \int_{y/2}^{9-y} \phi(x, y) dx \right\} dy$	06	2	2,4,5	3
5b)	Using Euler method find $y(0.06)$ given $\frac{dy}{dx} = y + x^2, y(0) = 1$ with $h = 0.02$	06	1	1,4,5	1
5c)	Solve $(D^2 + 2D + 3)y = x - x^2$	08	1	4,5	2
6a)	Change the order of integration and evaluate $\int_0^1 \left\{ \int_x^{2-x} \frac{x}{y} dy \right\} dx$.	06	2	4,5	2
6b)	Solve $x \sin x + \frac{dy}{dx} + y(x \cos x - \sin x) = 2$	06	1	2,4,5	1
6c)	Solve $\frac{dy}{dx} = xy$ with initial conditions $y(1) = 2$ and find y at $x = 1.2, 1.4$ by Runge - Kutta Method of Fourth Order	08	1	1,4,5	1
7a)	In a circuit containing inductance L , resistance R and voltage E , the current i is given by $L \frac{di}{dt} + Ri = E$. Find the current i at time t if at $t = 0, i = 0$ and L, R, E are constants	06	3	3,5	5
7b)	Evaluate $\int_0^{\log 2} \int_0^x \int_0^{x+y} e^{x+y+z} dx dy dz$	06	2	4,5	4



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7c)	State and prove Duplication formula	08	3	1	4
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ENDSEM/RE-EXAMINATION MAY/JUNE 2026

Program: B.Tech. in Civil Engineering

First Year

Duration: 3 hrs.

Course Code: ES-BTC201

Sem - II

Maximum Points: 100.

Course Name: Engineering Graphics

Semester: II

Important Notes:

22/05/26

1. Attempt **any five** out of seven questions.
2. Create a new folder and rename it to <Reg. No. ENDSEM>
3. Create separate .dwg file for each question and save in the above created folder only. File name should be <Q1_Reg. no. ES>.
4. At the end of exam, your folder with autocad will be uploaded by the authorized person. Students, before leaving the exam seat, should confirm that his/her folder is uploaded by the authorized person and question paper is submitted back to the Invigilator
5. Assume suitable data only if necessary.
6. **Save your Work** in AutoCad Regularly.

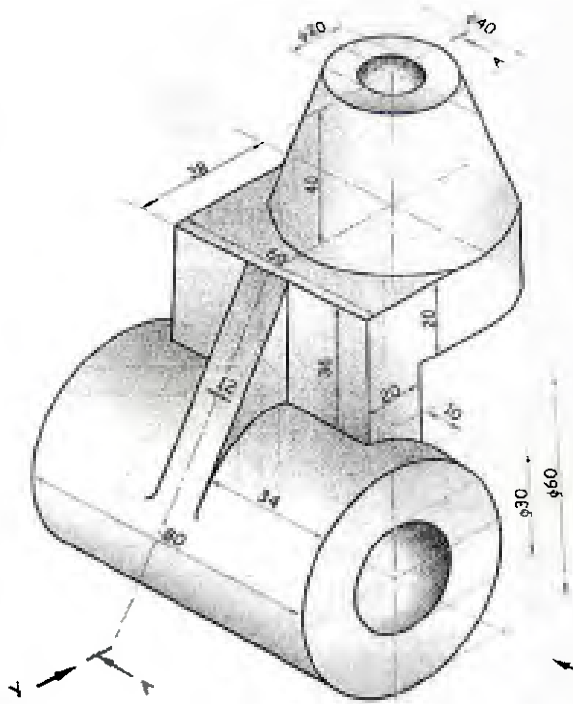
Q. No.			Points	CO	BL	MO
Q.1	a.	A circle of 50 mm diameter rolls along a line inclined at an angle of 30° without slipping. Draw a curve traced by a point on the circumference for one complete revolution of the circle. Name the Curve.	10	1,2	3	1
	b.	A pentagonal lamina of side 40 mm is resting in the H.P. on one of its corners. The plane makes an angle 45° with the H.P. Draw the projections of the lamina.	10	1,3	3	3
Q.2	a.	Draw an ellipse having major axis 100 mm and minor axis 70 mm long by the concentric circle method.	10	1,2	3	1
	b.	A line AB, having length 60 mm has its end point A, 20 mm above H.P. and 20 mm in front of V.P. The line is parallel to H.P. and inclined to V.P. at 45° . Draw the projections of line AB.	10	1,3	3	2



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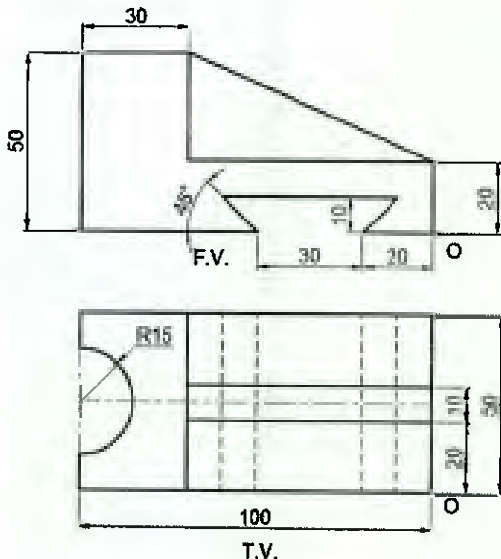
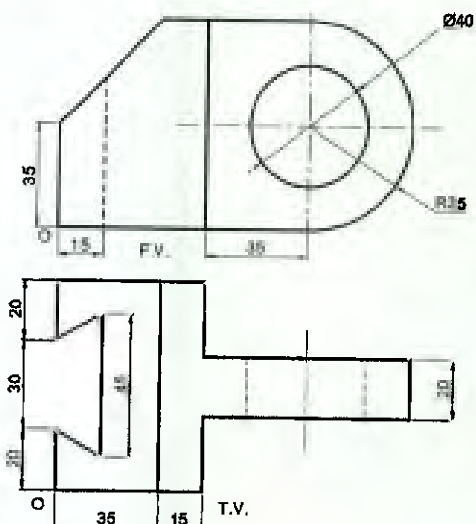
Q.3	a.	A right circular cylinder diameter of base 60 mm and axis height 90 mm has one of the circumference point of base in the H.P. such that its axis is inclined at 30° to the H.P. Draw its projections.	10	1,3	3	4
	b.	A hexagonal lamina of side 30 mm is resting in the V.P. on one of its corners. The diagonal through that corner makes an angle 60° with the V.P. Draw the projection of the plane.	10	1,3	3	2
Q.4	a.	For the given figure below, draw the following orthographic views:	20	2,4	3	5
		a. Front View b. Top View c. Right Hand Side View 	07 07 06			



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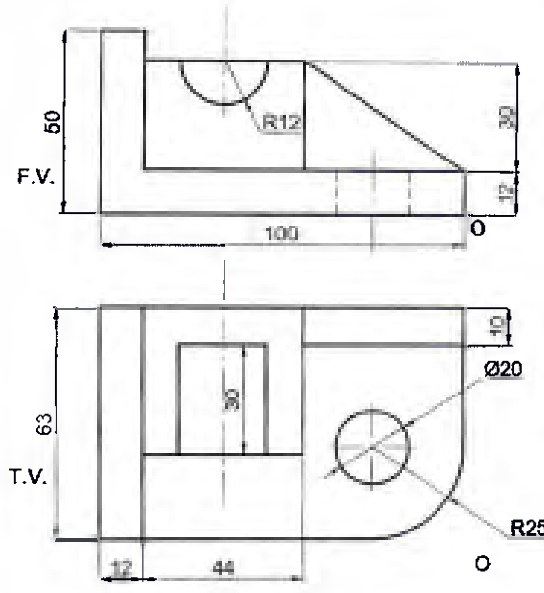
Q.5	a.	Draw an involute of a regular hexagon having side 40 mm.	10	1,2	3	1
Q.5	b.	Draw the Isometric view for the given orthographic views below: 	10	2,4	3	5
Q.6	a.	Given is the F.V. and T.V. Draw the following: i. FV ii. TV iii. Missing LHSV 	15 02 03 10	2,4	3	5



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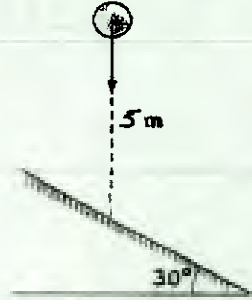
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Q.6	b.	A line MN, having length 50 mm, is parallel to V.P. and perpendicular to H.P. Line is 20 mm in front of V.P. and point M is 10 mm above H.P. and 20 mm in front of V.P. Draw the projections of line MN.	05	1,3	03	02
Q.7	a.	Draw the Isometric view 	10	2,4	03	05
	b.	A square pyramid with side of base 40 mm and axis height 60 mm is resting on the H.P. on one of its base corner such that its axis is inclined at 35° to the H.P. and 45° to the V.P. Draw its projections.	10	1,3	03	04

**END SEMESTER ~~May 2026~~ / RE-EXAM June 2026**Program: F.Y.BTech (Civil)Course Code: ES-BTC202Course Name: Engineering Mechanics-II (R23)*First Year B.tech**Civil**Sem-II*Duration: **3 hours**Maximum Points: **100**Semester: II**Notes:**

1. Attempt **any five** out of the seven questions.
2. Start each new question on a new page. All sub-questions should be written grouped together.
3. Assume suitable data if necessary and state it clearly.
4. Use of scientific calculator is permitted.
5. Take gravitational acceleration $g = 10 \text{ m/s}^2$ wherever required

Q.No.	Questions	Points	CO	BL	Module No.
Q.1(a)	A ball is dropped from a height of 5 m on an inclined surface of 30 degree inclination as shown. Calculate the magnitude and direction of velocity of the ball after impact. Take the coefficient of restitution as 0.6 	10	2,4	2,3	2,5
Q.1(b)	A ball 'A' is projected vertically upwards from the top of a tower 200 m high, with a velocity of 50 m/s. After T seconds, another ball 'B' is dropped from the same point. If both the balls reach the ground at the same time simultaneously, calculate T and velocities of each ball on reaching the ground.	10	2	2,3	2
Q.2(a)	A uniform ladder of length 4 m length rests against a vertical wall with which it makes an angle of 30°. The coefficient of friction between the ladder and the wall is 0.1 and that between ladder and the floor is 0.25. If a man, whose weight is one-half of that of the ladder ascends it, what distance d high up the ladder will he be when the ladder starts to slip? 	10	1	2,3	1

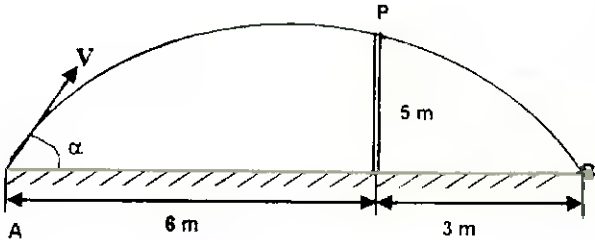
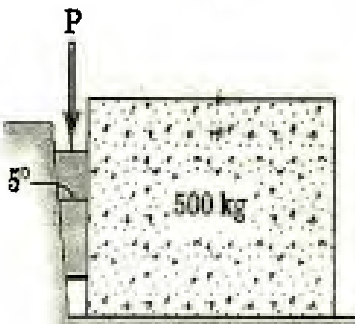
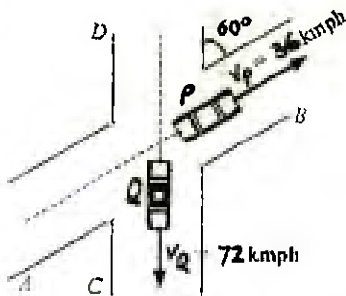


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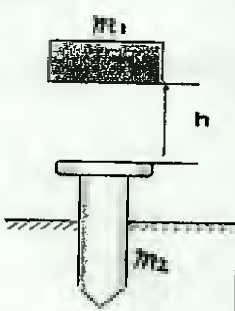
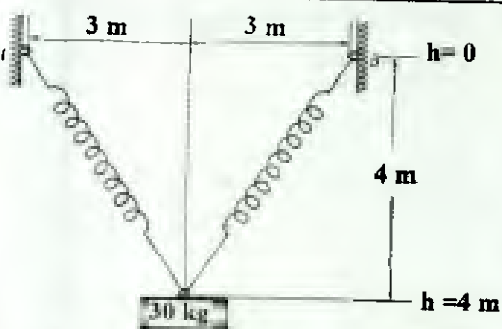
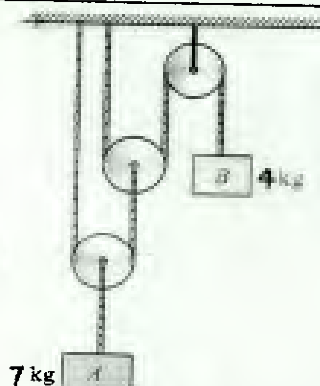
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END SEMESTER May 2026 / RE - EXAM June 2026

Q.2(b)	Calculate the least initial velocity 'V' of projectile at point 'A' so that it just clears a wall 5 m high at point 'P' as shown and strikes the horizontal plane at B. 	10	2	2,3	2
Q.3(a)	The horizontal position of the 500kg rectangular block of concrete is adjusted by the 5° wedge under the action of the force P. If the coefficient of static friction for both wedge surfaces is 0.3 and if the coefficient of static friction between the block and the horizontal surface is 0.6, determine the least force P required to move the block. Assume the wedge as of negligible mass. 	10	1	2,3	1
Q.3(b)	Two cars P and Q pass through the intersection at the same instant with velocities 36 kmph and 72 kmph along the roads AB and DC respectively as shown. Calculate the relative velocity of car Q with respect to car P and the distance between the two cars after 2 seconds 	10	2	2,3	2

**END SEMESTER May 2026 / RE-EXAM June 2026**

Q.4(a)	A pile hammer m_1 of mass 1500 kg drops from a height of $h = 600$ mm on a pile m_2 of mass 750 kg. The pile penetrates 50 mm per blow into the ground. Assuming that the motion of the pile is resisted by a constant frictional force, calculate the resistance to penetration of the ground. Assume perfectly plastic impact. Use Work-Energy theorem.		10	4	2,3	4,5
Q.4(b)	A block of 30 kg is released from rest at $h=0$ as shown. Determine its speed when $h=4$ m. The springs each have unstretched length of 3 m and spring constant of 40 N/m		10	4	2	4
Q.5(a)	Determine the tension developed in chords, attached to each block and the accelerations of the blocks when the system shown is released from rest. Neglect the mass of the pulleys and chords. Use D'Alembert's principle.		10	3	2,3	3
Q.5(b)	A point moves along the path $y = x^2 + 5$ with a constant speed of 8 m/s. What are the x and y components of the velocity when $x=3$? What is the total acceleration of the point when $x = 3$?		10	2	2,3	2
Q.6(a)	A ball is dropped onto a smooth horizontal floor from height 'H'. It bounces back 9m for the first bounce, and attains height of 6m on the second bounce. (i) Calculate the coefficient of restitution between the ball and the floor. (ii) Also determine the original height 'H' from which the ball was dropped.		10	2	2,3	2



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END SEMESTER May 2026 / ~~RE-EXAM~~ June 2026

Q.6(b)	i. Explain conservative forces, non-conservative forces and principle of conservation of energy ii. Explain principle of impulse and momentum	10	4	2	4,5
Q.7	i. Enlist the laws of friction. ii. Explain D'Alemberts principle of Dynamic Equilibrium iii. Explain principle of conservation of momentum iv. Explain coefficient of restitution	20	1,3,4	2	1,3,5



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END SEM/RE-EXAM EXAMINATION MAY/JUNE 2025-26

Total Marks: 100

CLASS/SEM : F.Y.B.Tech Civil Sem.-II

COURSE CODE: BSBTC202

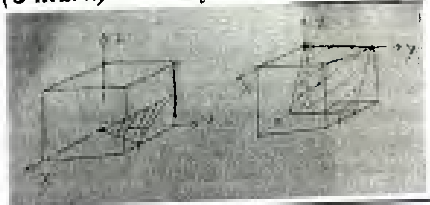
Duration: 3 Hrs

COURSE NAME : ENGINEERING PHYSICS

May
Sem-II 28/05/26

- Answer any FIVE questions out of SEVEN.
 - Answers to all sub questions should be grouped together!
 - Diagrams have to be drawn wherever necessary. Assume suitable data (if necessary) and state your assumptions clearly.
 - Marks for each question are indicated against it. Figures to the right indicate Module no (MN), Course Outcome (CO) and Bloom's Taxonomy Level (BL) respectively.
 - Marks will be given on the basis of what will be written in the paper irrespective of your intentions!
- Good luck!

Q1.	(20 mark) (4 mark each)	MN/CO	BL
a.	A microscope using suitable photons is employed to locate an electron in an atom within a distance of $0.1 \text{ \AA}$. Evaluate the uncertainty involved in measurement of its velocity.	1	3
b.	A proton is confined in an infinite square well of width 10 fm. (The nuclear potential that binds protons and neutrons in the nucleus of an atom is often approximated by an infinite square well potential). Calculate the energy and wavelength of the photon emitted when the proton undergoes a transition from the first excited state to the ground state.	2	3
c.	An orthorhombic crystal has the magnitude of primitive vectors as $a=0.121 \text{ nm}$, $b=0.184 \text{ nm}$ and $c=0.197 \text{ nm}$. If a plane with Miller indices (231) cuts an intercept of 0.121 nm along X axis, find the intercepts along Y and Z axes.	3	3
d.	An ultrasonic beam of 1cm sent by a ship, returns from the sea bed after 2s. The velocity of ultrasonic waves in sea water is 1510 m/s and 0°C . Salinity of sea water is 2 gm/lit at $T=30^\circ\text{C}$. Calculate the depth of the sea and frequency at 30°C .	4	3
e.	Newton's rings are observed in the reflected light of wavelength $5900 \text{ \AA}$. The diameter of the 10th dark ring is 0.456 cm . Find: a. Radius of curvature of the lens and b. Thickness of the air film at that point.	5	3
Q2.	(20 mark) (4 mark each)		
a.	An electron and a proton are both accelerated by the same potential difference $V=54 \text{ kV}$. Evaluate their de-Broglie wavelengths and compare.	1	3
b.	A small 0.50-kg cart is moving back and forth along an air track between two bumpers located 2.0 m apart. We assume no friction; collisions with the bumpers are perfectly elastic so that between the bumpers, the cart maintains a constant speed of 0.75 m/s . Treating the cart as a quantum particle, estimate the value of the principal quantum number that corresponds to its classical energy.	2	3
c.	Gold with atomic radius $1.44 \text{ \AA}$ and FCC structure is being used to determine wavelength of X-rays. Calculate the wavelength of X-rays if the (111) plane diffracts the beam by 32° . Assume first order diffraction.	3	3

d.	Find thicknesses of quartz plates used for producing frequencies 30 kHz and 1 MHz each having density 8.9 gm/cc and Young's modulus 20.8×10^{10} N/m ² . Comment on the results.	4	3
e.	Newton's rings are formed with reflected light of wavelength $5893 \text{ \AA}$ with a liquid in between the plane and the curved surfaces. The diameter of the 5 th dark ring is 0.003m and the radius of curvature of the lens is 1.2m. Calculate refractive index of the liquid. Also evaluate for the same setup, the fringewidth between the 45th ring and the 46th ring.	5	3
Q3.	(20 mark)		
a.	(8 mark) A golf ball has a mass of 40gm and a speed of 45m/s. If the speed can be measured to an accuracy of 2%. Calculate (a) de-Broglie wavelength (b) Kinetic energy (c) Uncertainty in momentum (d) Uncertainty in position of the golf ball.	1	3
b.	(6 mark) Find the natural frequency of vibrations of a quartz plate of thickness 1.8mm. Given Young's modulus = 8×10^{10} N/m ² , density = 2650 kg/m ³ . Calculate the change in thickness if the same plate is used to produce ultrasonic waves of frequency 2 MHz. If the calculated natural frequency is sent down to the sea bed, calculate the depth of the sea. Given: the velocity of ultrasonic waves in sea is 1400 m/s, time required for the wave to be received is 0.65 s.	4	3,4
c.	(6 mark) A monochromatic light with a frequency of 7.5×10^{14} Hz is travelling through the air and is incident on a water ($\mu_f=1.3$) coating on top of a piece of glass ($\mu=1.5$) at 30° . Determine: (a) The minimum thickness of the film that will result in constructive interference of the reflected light (b) Suppose the indices of refraction of the film and glass were switched, would your answer to part a remain the same or would they switch? Explain.	5	3,4
Q4.	(20 mark)		
a.	(8 mark) Describe the formation of continuous and characteristic X-rays and also plot the corresponding spectra.	1	2
b.	(6 mark) Derive an expression for interplanar spacing between planes having Miller indices (hkl) for a general lattice having lattice constants a,b,c.	3	4
c.	(6 mark) Explain working of a magnetostriction oscillator using a neat and labeled diagram.	4	2
Q5.	(20 mark)		
a.	(8 mark) State the value of energy and wavefunction of a particle confined in a one dimensional box of length L, and plot the wavefunctions and probabilities. Evaluate the ground state energy (in eV) of a proton confined to a one-dimensional box the size of the uranium nucleus that has a radius of approximately 15.0 fm.	2	1,2
b.	(6 mark) Derive an expression for path difference when light falls on a wedge shaped film setup. Also explain why the fringes are straight and parallel and equidistant.	5	4
c.	(6 mark) State and explain de-Broglie's hypothesis using the Davisson Germer experiment.	1	1,2
Q6.	(20 mark)		
a.	(8 mark) Write a note on diamond crystal structure explaining average number of atoms, Co-ordination number and Atomic packing factor.	3	2
b.	(6 mark) Explain piezoelectric and inverse piezoelectric effects in detail.	4	2
c.	(6 mark) Derive wavefunction and energy values for a quantum mechanical free particle moving along the positive X-direction.	2	3
Q7.	(20 mark)		
a.	(8 mark) State the intensity expression when light undergoes single slit diffraction through a slit width a and also derive conditions and values of principal maximum, secondary maxima and minima.	5	1
b.	(6 mark) Arrive at Schrodinger's time dependent equation.	2	3
c.	(6 mark) Identify Miller indices of the following planes and also draw their directions.	3	2,4
			



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

End Semester Examination/ Re-Examination, May /June 2026



First Year B.tech

01/06/26

Max. Marks: 50 marks

Class: (C/M/E)

Semester: II

Duration: 120Min

Program: F.Y.B. Tech (C/M/E)

Name of the Course: Indian traditional Knowledge

Course Code : IK-BTM201

Instructions:

- 1 Read all instructions carefully before attempting the questions
- 2 Justify your answers with examples where applicable
- 3 Prioritize questions that carry higher marks or require more detailed responses.
- 4 Avoid writing excessive content. Stick to the points and explanations relevant to the question
- 5 Attempt any four questions from Q1 to Q5, and any one question from Q6 or Q7.

Sem - II

Question No		Max. Marks	Course Outcome Number	Module No.
Q1				
a	Explain how geography, pilgrimage, and shared religious practices helped in maintaining Indian unity.	5	1,2	1
b	Write a short note on Mukarji's idea of Indian unity.	5	1	1
Q2				
a	Explain the challenges to unity in diversity in modern India.	5	2	1
b	Discuss the need for human values in science and technology, with suitable examples.	5	2	2
Q3		5		1
a	Explain the contribution of Nagarjuna in the field of ancient Indian chemistry and metallurgy	5	2	3
b	Write a short note on the contribution of ancient Indian chemistry in metallurgy, perfumes, pigments, and medicine.	5	1,4	3
Q4				
a	Discuss how ancient Indian innovations in engineering, such as water management systems and architectural marvels, have influenced modern engineering practices	5	1,4	3

— 1 —

	b	Explain how modern lifestyle changes such as sedentary work, stress, unhealthy eating habits, and lack of rest affect physical and mental health.	5	1,4	4
Q5					
	a	Describe the main features of Ajanta Cave paintings.	5	3	5
	b	Write a short note on ancient Indian architecture with examples such as Sanchi Stupa, Ajanta Caves, Ellora Caves, Khajuraho Temples, and Brihadeeswara Temple.	5	3	5
Q6					
	a	Compare the dance forms and music traditions of any two assigned states. Explain how these art forms reflect their cultural identity, folk traditions, and social life.	10	1,3	5
Q7					
	a	Prepare a detailed comparative study of two states from different regions of India based on language, food, dress, festivals, art forms, and architecture. Add suitable examples to support your answer.	10	3,4	6



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END SEM/RE-EXAM EXAMINATION MAY/JUNE -2026 (Set-1)

Program: B.Tech. Civil Engineering First Year

Duration: 3 Hour

Course Code: PC-BTC201

B.Tech Civil (Sem-I) Maximum Points: 100

Course Name: Building Materials and Construction

Semester: II

Notes:

03/06/26

1. Attempt *any FIVE questions out of SEVEN* questions
2. Answers to all sub questions should be grouped together
3. Draw neat diagrams wherever required
4. Assume suitable data if necessary and state the clearly.

Q.No.	Questions	Points	CO	BL	Module No.
1	a) What are the requirement of good partition wall?	05	1	1	01
	b) How you can identify defects in painting?	05	3	2	07
	c. Explain with neat sketch Block board.	05	2	2	01
	d. Discuss segregation and bleeding in concrete.	05	3	2	01
2	a). What are the requirement of good stair?	05	02	1	07
	b). Explain with neat sketch construction of Cavity wall.	06	03	2	01
	c. How Clay bricks are classified?	06	03	2	02
	d. Differentiate between Hydraulic lime and Pure lime.	03	01	4	07
3	a. Suggest the suitable method of shoring to provide opening in existing brick wall.	05	02	3	02
	b. What are the requirement of Good scaffolding?	04	03	2	08
	c. Explain with neat sketch Natural seasoning of timber?	06	03	2	02
	d. How preservation of stone is carried out?	05	04	2	03
4	a. How the construction of ground floor is carried out?	06	2	2	03
	b. Describe in brief methods of Damp Proofing.	07	4	2	03
	c. Explain in detail qualities of good formwork.	07	1	1	05



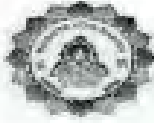
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END SEM/RE-EXAM EXAMINATION MAY/JUNE -2026 (Set-1)

5.	a. Differentiate between plastering and pointing.	05	2	4	01
	b. Explain with neat sketch cantilever scaffolding.	05	3	2	07
	c. What are the qualities of good Timber?	10	3	1	04
6	a) Discuss uses of lime in construction.	05	3	1	08
	b) Differentiate between softwood and hard wood.	06	3	2	01
	c. What is Alkali Aggregate reaction in concrete?	05	2	2	01
	d. What are the field test used to check quality of brick?	04	1	3	01
7	a. Discuss quality characteristics of good paint.	06	1	2	1
	b. Explain the term calcination and Pulverization w.r.t. lime.	04	3	3	1
	c. Write short notes on (any two)	10			
	i. Veneer	5	2	1	1
	ii. Functional requirement of building	5	2	2	1
	iii. Dry wall partition	5	3	3	3
	iv. grades of cement	5	4	2	1



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Re – End Semester Exam

May 2026

Communication Skills

Max. Marks: 100

Class: F.Y. B. Tech (CME)

Course Code: AE BT 201

Semester: II

Duration: 3 Hours

Program: B. Tech

NOTE:

Sem-II

14/07/26

- Question number **One** is compulsory.
- Out of remaining **Six** questions attempt any four
- Please write subsections of questions in a sequence
- Draw diagrams and charts wherever necessary

Sr.No	Questions	Points	CO	BL
Q.1. A	What are various channels of communication? Explain the difference between the formal and informal channels of communication. Briefly discuss the formal channel of communication, advantages and disadvantages.	12	02	01
Q.1.B	Write Short Notes on any (ONE) a. Content of an email and strategies to write an effective email b. Semantic barriers to communication c. Body language as means of non-verbal communication	08	02	02
Q.2. A.	Does our culture influence our interpretation of the behaviour of those from other cultures? Explain the cultural barriers to communication in relation to values, time, space, paralanguage, colour, space distance.	12	03	03
Q.2. B.	What do you mean by solicited and unsolicited enquiries? Mention the steps to write an enquiry letter.	08	02	01
Q.3.A	Sardar Patel College of Engineering, Mumbai, recently purchased 25 Lenovo IdeaPad Slim 5 laptops (Order No.: SPC/IT/2026/0412) from Lenovo India Pvt. Ltd. for use in their computer laboratory. Upon delivery and installation, the IT department discovered issues like failing to boot, defective keyboards and overheating. The delivery was also delayed 7 days beyond the promised date. The institute had made full payment in advance and expected fully functional systems as per the agreed specifications. These issues	12		

	are disrupting academic activities and scheduled lab sessions for students. Write a formal complaint letter addressed to Lenovo India Pvt. Ltd., claiming a fair compensation from the company. (Use Modified Block format).			
Q.3.B	Explain You-attitude and courtesy and consideration in business correspondence.	08		
Q.4. A.	Tech Nova Institute, a reputed engineering college in Mumbai, organized an Inter-College Innovation Summit where students were invited to present their project ideas before industry experts and investors. A team of first-year students—Rohan, Aditi, and Sameer—was selected to present their project on " <i>Smart Energy Management System</i> ." While their project was technically sound, they faced challenges in communication. They did not know how to converse with other teams, they had not formally learned speaking skills, barriers to speaking, and strategies to effective speaking. As a first-year student provide information on good and effective conversations, public speaking, Strategies to effective public speaking and also explain in detail the talk power program.	12		
Q.4. B	Draw the semi-block format mentioning the compulsory and optional parts of the letter.	08		
Q.5. A.	The First year Engineering students at <i>Sardar Patel College of Engineering, Mumbai</i> is planning a five -day industrial visit for 70 first-year students as part of their academic curriculum. The faculty coordinator intends to organize this visit to <i>Tata Motors Ltd., Pune</i> , a leading automobile manufacturing company, to give students practical exposure to industrial processes. The faculty has asked you to make the necessary arrangements for the same in liaison with the above company. Write a formal enquiry letter to the HR/Administration Department of Tata Motors Ltd., Pune, including informing them the Purpose of the visit and academic relevance, asking them about accommodation facilities, Food, travel facilities, sightseeing for the same. Please provide complete details and ask them to send their quotation for the same within one week of the enquiry. (Use Modified Block Form)	12	04	05
Q.5. B.	Explain the Johari window model in detail.	08	04	05
Q.6. A.	What is the importance of non-verbal communication in business settings? How can paralanguage impact what you are saying? Explain the aspects of paralanguage with examples.	12	04	01
Q.6.	Differentiate between oral and written communication.	08		

B.				
Q.7. A	Case Study; An Indian IT company collaborates with a Japanese client for a software project. During virtual meetings, the Indian team members speak openly, interrupt occasionally, and express disagreement directly. However, the Japanese clients remain mostly silent and avoid direct confrontation. The Indian team assumes that the clients agree with their ideas. Later, the project faces delays because the client's expectations were different, but they had not explicitly voiced disagreement. Questions: 1. Identify the type of communication barrier in this case. 2. What cultural differences contributed to the misunderstanding? 3. How could both teams improve cross-cultural communication?	12		
Q.7. B.	Write an email to the Head of Department seeking permission to organize a workshop for 7 days in the college premises on Python, MATLAB, Auto CAD.	08		



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PREVIOUS SEMESTER EXAMINATION JULY 2025-26

R23 (2023-24/ 2024-25)

Total Marks: 100

CLASS/SEM : F.Y.B.Tech Civil Sem.-II

COURSE CODE: BSBTC202

Duration: 3 Hrs

COURSE NAME : ENGINEERING PHYSICS

First Year
Sem - II

15/07/26

- Answer any FIVE questions out of SEVEN.
- Diagrams have to be drawn wherever necessary. Assume suitable data (if necessary) and state your assumptions clearly.
- Figures to the right indicate Mark, Module no, Course Outcome and Bloom's Taxonomy level respectively.
- Marks will be given on the basis of what will be written in the paper irrespective of your intentions!

Good luck!

		Mark	MN	C O	BL
Q1.	(20 mark)				
a.	X- rays of unknown wavelength give first order Bragg reflection at glancing angle 20° with (212) planes of copper having F.C.C. structure. Find wavelength of X-rays if the atomic radius of copper is $1.278 \text{ \AA}$.	5	1	1	3,5
b.	The distance between the middle layer of the hcp cell and top layer just above the first hcp cell is 0.75 nm . What is the density of the unit cell?	5	3	3	3
c.	Calculate the numerical aperture and hence the critical angle for an optical fiber given that the refractive indices of the core and the cladding are 1.45 and 1.40.	5	5	5	3
d.	In an oscillator, the value of inductance and capacitance is 5 mH and 12 pF . Given: density of rod = 2.5 gm/cc , $Y=8 \times 10^{10} \text{ N/m}^2$ find length of the rod and frequency.	5	4	4	3,5
Q2.	(20 mark)				
a.	Arrive at Schrodinger's time dependent equation and reduce to its time independent form.	8	2	2	2
b.	If the pulse width of a Ruby laser is 25 ns and average output power per pulse is 0.8 W , how many photons does each pulse contain?	6	5	5	3,5
c.	Draw (100) and (110) set of planes of FCC structure and hence explain its interplanar spacing and planar atomic densities.	6	3	3	3
Q3.	(20 mark)				
a.	Derive expression for Numerical Aperture in Optical fibers and hence define these terms.	8	5	5	3
b.	Evaluate the ground state energy (in eV) of a proton confined to a one-dimensional box the size of the uranium nucleus that has a radius of approximately 15.0 fm . Also evaluate the wavelength of transition when it comes from $n=2$ to the ground state.	6	1	1	4

c.	An ultrasonic beam of 1cm sent by a ship, returns from the sea bed after 2s. The velocity of ultrasonic waves in sea water is 1510 m/s and 0°C. Salinity of sea water is 2gm/lit at T=30°C. Calculate the depth of the sea and frequency at 30°C	6	4	4	3
Q4.	(20 mark)				
a.	Explain Diamond structure in detail mentioning clearly average number of atoms in the unit cell, Coordination number, Nearest neighbouring distance, Atomic Packing Factor.	8	3	3	1, 3
b.	A bullet of mass 0.03 kg is moving with a velocity of 500 m/s. The speed is measured up to an accuracy of 0.02%. Calculate the uncertainty in it's position. Also comment on the result.	6	1	1	2
c.	Calculate the numerical aperture and the angle of acceptance of an optical fiber having fractional RI of 0.05 and core refractive index of 1.48.	6	5	5	3,5
Q5.	(20,mark)				
a.	Explain construction and working of a He-Ne laser in detail.	8	5	5	1,2
b.	If a He-Ne laser output falls on a BCC (100) crystal plane with lattice constant 4640nm, find the order of diffraction from these planes if the diffraction angle is 23°.	6	3&5	3	3
c.	What is the ΔE between the $n=2$ and $n=3$ states for an F_2 molecule trapped within a one-dimension well of length 3.0 cm? At what value of n does the energy of the molecule reach $\frac{1}{4}k_B T$ at 450 K, and what is the separation between this energy level and the one immediately above it? Given: mass of F_2 molecule is 3.16×10^{-26} kg.	6	2	2	3,4
Q6.	(20 mark)				
a.	Explain the principle of working of a piezoelectric oscillator in detail with a neat and labeled diagram.	8	4	4	3
b.	A small 0.50-kg cart is moving back and forth along an air track between two bumpers located 2.5 m apart. We assume no friction; collisions with the bumpers are perfectly elastic so that between the bumpers, the car maintains a constant speed of 1.50 m/s. Treating the cart as a quantum particle, estimate the value of the principal quantum number that corresponds to its classical energy.	6	2	5	3
c.	Explain (with both mathematical and Physical reasoning) Heisenberg's Uncertainty Principle using the wavegroup concept.	6	1	1	3
Q7.	(20 mark)				
a.	Derive the Energy Eigen values and Eigen functions for a particle moving in an infinite height and of width L. Also sketch the probability function for the states $n=1$ and 2.	8	2	2	3
b.	Draw a diagram which clearly mentions important axes of a quartz crystal. Further explain piezoelectric and inverse piezoelectric effects with a neat diagram.	6	4	4	3
c.	Prove using Heisenberg's uncertainty principle that a particle in a box of infinite height cannot have Zero energy!	6	1	1	3,5



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END SEMESTER May 2026 / RE - EXAM June 2026

Program: F.Y.BTech (Civil) *First Year B. Tech Civil* Duration: 3 hours

Course Code: ES-BTC202

Maximum Points: 100

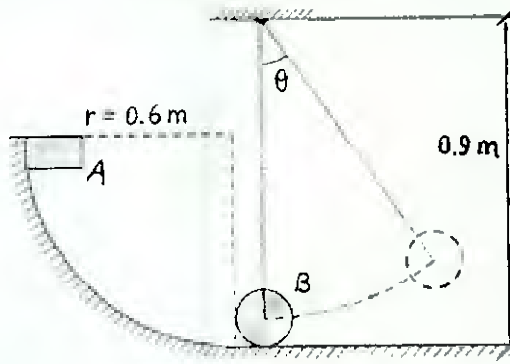
Course Name: Engineering Mechanics-II (R23)

Semester: II

15/07/26

Notes:

1. Attempt **any five** out of the seven questions.
2. Start each new question on a new page. All sub-questions should be written grouped together.
3. Assume suitable data if necessary and state it clearly.
4. Use of scientific calculator is permitted.
5. Take gravitational acceleration $g = 10 \text{ m/s}^2$ wherever required.

Q.No.	Questions	Points	CO	BL	Module No.
Q.1(a)	Block A of mass 2 kg is released from rest and slides without friction until it strikes the ball B of mass 3 kg of the simple pendulum as shown. Coefficient of restitution between block A and ball B is 0.8 Determine: (i) velocity of ball B immediately after impact (ii) maximum angular displacement of the pendulum 	10	4	2,3	4,5
Q.1(b)	A helicopter going vertically up with a constant velocity 'V' m/s drops first batch of packet, which takes 2 seconds to reach the ground. No sooner this batch reaches the ground, the second batch of packets are released and this batch takes 3 seconds to reach the ground. Determine: (i) the height from which the first batch was released (ii) velocity of the helicopter	10	2	2,3	2

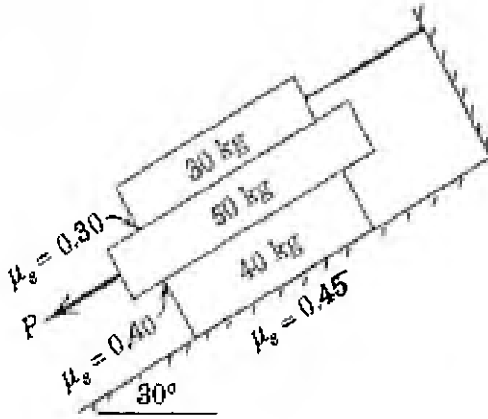
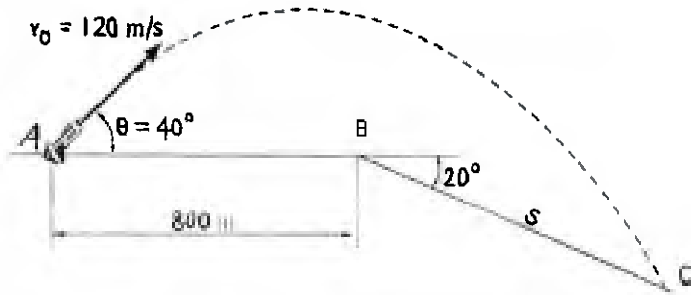
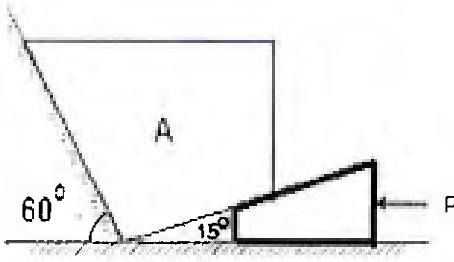


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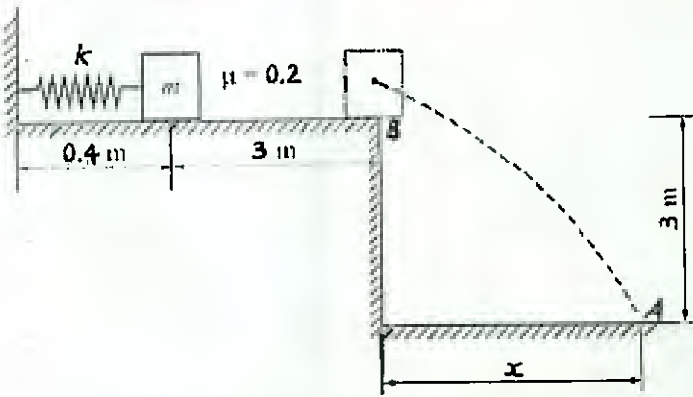
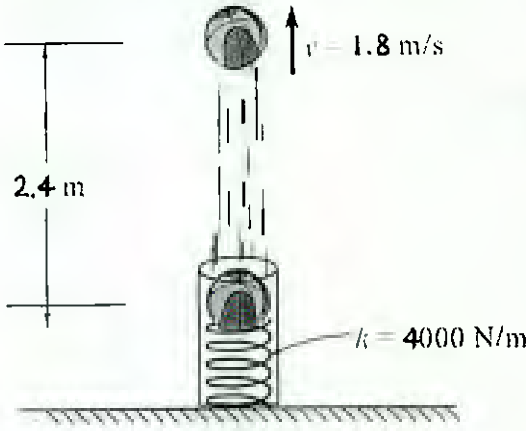


END SEMESTER May 2026 / RE - EXAM June 2026

Q.2(a)	The three flat blocks are positioned on the 30° incline as shown, and a force P parallel to the incline is applied to the middle block. The upper block is prevented from moving by a wire which attaches it to the fixed support. The coefficient of static friction for each of the three pairs of surfaces is shown. Determine the maximum value which P may have before any slipping takes place. 	10	1	2,3	1
Q.2(b)	A projectile launched from A with initial velocity 120 m/s as shown. Determine (i) distance 's' along the inclined slope (ii) time of flight from A to C 	10	2	2,3	2
Q.3(a)	Determine the minimum value of the force P required to begin moving the block A of 500 kg up the incline of 60°. Neglect the weight of the wedge. The coefficient of static friction for all surfaces is 0.25 	10	1	2,3	1



END SEMESTER May 2026 / RE - EXAM June 2026

Q.3(b)	The acceleration of the particle is defined by the relation $a = 10 - x^2 \text{ mm/s}^2$. The particle starts with no initial velocity at the position $x = 0$. (a) Determine the velocity when $x = 2 \text{ mm}$ (b) the position when velocity is again zero (c) position where the velocity is maximum.	10	2	2,3	2
Q.4(a)	A block of mass $m = 50 \text{ kg}$ is compressed against a spring as shown. How far from point B [distance x] will the block strike on the plane at point A. Take free length of spring as 0.7 m and spring stiffness as $k = 60 \times 10^2 \text{ N/m}$. 	10	4	2,3	2,4
Q.4(b)	A 30 N ball is fired from a tube by a spring having a stiffness $K = 4000 \text{ N/m}$ as shown. Determine how far the spring must be compressed to fire the ball from the compressed position to a height of 2.4 m , at which point it has a velocity of 1.8 m/s . 	10	4	2,3	4

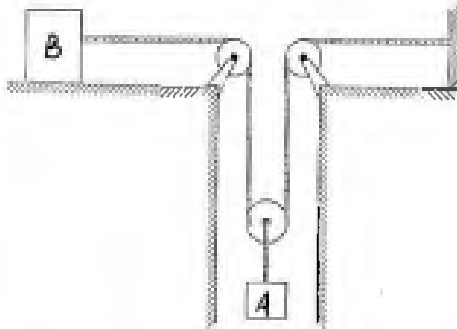
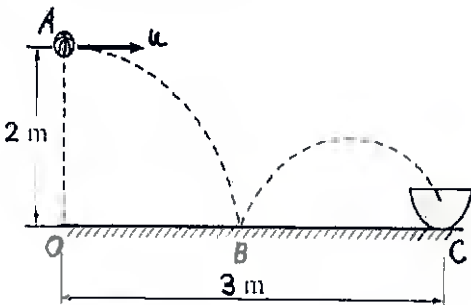


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END SEMESTER May 2026 / RE - EXAM June 2026

Q.5(a)	At a given instant the 100 N block A is moving downward with a speed of 2 m/s. Determine its speed 2 seconds later. Block B has a 50 N weight, and the coefficient of kinetic friction between it and the horizontal plane is 0.2. Neglect the mass of pulley's and chord. Use D'Alembert's principle.	10	3	2,3	3
					
Q.5(b)	A particle moves with a constant speed of 5 m/s along the path $y = x^2/4$. Compute magnitude and direction of the total acceleration of particle when $x = 2$ m	10	2	2,3	2
Q.6(a)	Determine the horizontal velocity u at A as shown at which we must throw the ball so that it bounces once on the surface and then lands into the cup at C. Take coefficient of restitution between ball and surface as 0.8 and neglect the size of the cup.	10	2	2,3	2
					
Q.6(b)	Explain the following terms with suitable diagrams: (i) Line of impact (ii) Central impact (iii) Non-central impact (iv) Direct central impact (v) Oblique central impact	10	4	2	5
Q.7	Explain the following terms with suitable diagrams: a) Limiting frictional force b) Coefficient of restitution c) D'Alembert's principle of Dynamic Equilibrium d) Work-Energy Theorem	20	1,3,4	2	1,3,5

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July
ENDSEM/RE - EXAMINATION MAY/JUNE 2026

Program: B.Tech. in Civil Engineering *First Year B.tech* Duration: 3 hrs.

Course Code: ES-BTC201

Maximum Points: 100.

Course Name: Engineering Graphics

Civil
Sem - II

Semester: II

Important Notes:

1. Attempt any **five** out of seven questions.
2. Create a new folder and rename it to <Reg. No. _ENDSEM>
3. Create separate .dwg file for each question and save in the above created folder only. File name should be <Q1_Reg. no. _ES>.
4. At the end of exam, your folder with autocad will be uploaded by the authorized person. Students, before leaving the exam seat, should confirm that his/her folder is uploaded by the authorized person and question paper is submitted back to the Invigilator
5. Assume suitable data only if necessary.
6. **Save your Work** in AutoCad Regularly.

17/07/26

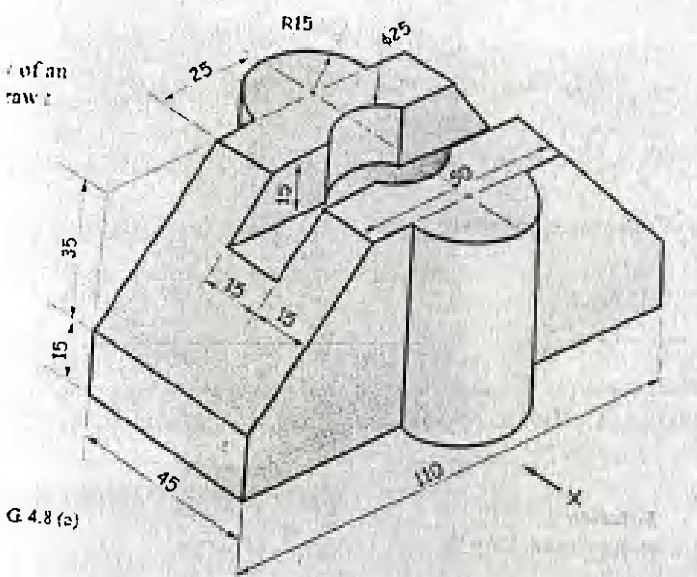
Q. No.			Points	CO	BL	MO
Q.1	a.	Draw a parabola having base length 200 mm and axis height 150 mm by the rectangle method.	10	1,2	3	1
	b.	A pentagonal lamina of side 40 mm is resting in the V.P. on one of its side. The diagonal through that corner makes an angle 45° with the V.P. Draw the projections of the lamina.	10	1,3	3	3
Q.2	a.	A line 70 mm long is inclined at an angle 30° to the H.P. and 45° to the V.P. Its end point A is 10 mm above H.P. and 20 mm in front of V.P. Draw the projections of line AB. Assume line to be completely in first quadrant.	10	1,3	3	2
	b.	Draw a Helical path of pitch equal to 70 mm on a cylinder of diameter 40 mm.	10	1,2	3	1



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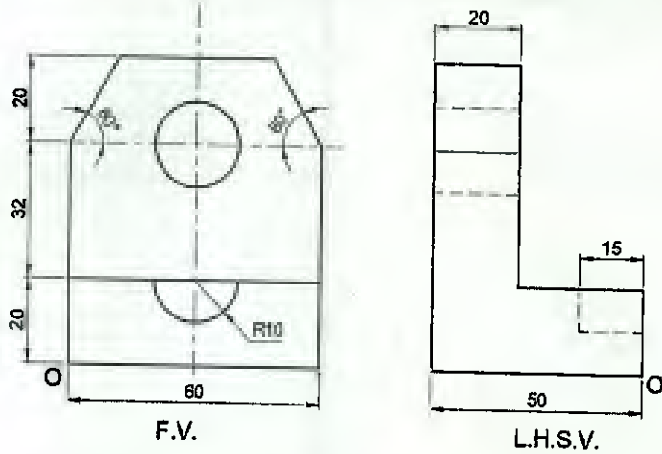
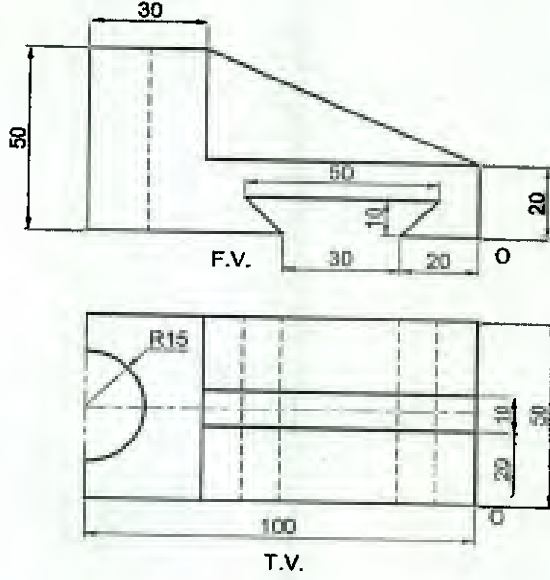
Q.3	a.	A right circular cylinder diameter of base 50 mm and axis height 80 mm has one of the circumference point of base in the H.P. such that its axis is inclined at 45° to the H.P. Draw its projections.	10	1,3	3	4
	b.	A rectangular lamina ABCD having length 50 mm and breadth 30 mm has its surface inclined to the H.P. at an angle 40° and perpendicular to the V.P. such that the shorter side AB of the rectangle plane is 20 mm above the H.P. and longer side AD of rectangle is 10 mm in front of V.P. Draw the projections of the plane.	10	1,3	3	2
Q.4	a.	For the given figure below, draw the following orthographic views:	20	2,4	3	5
	i.	Front View	06			
	ii.	Top View	07			
	iii.	Left Hand Side View	07			
						



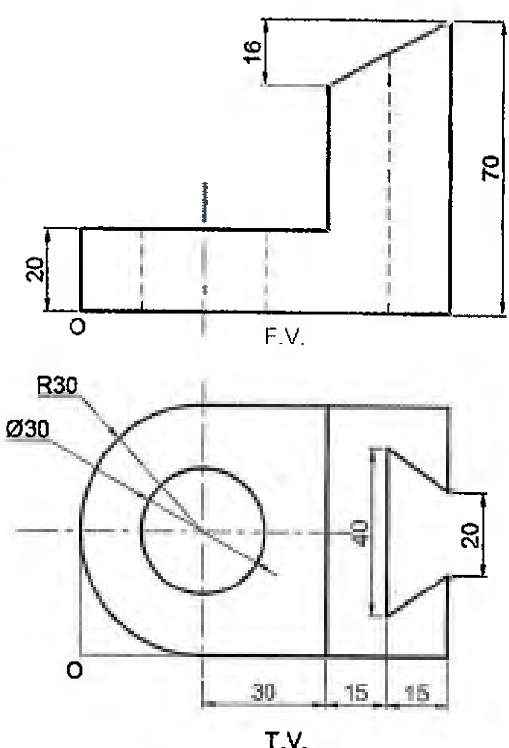
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Q.5	a.	Given is the F.V and LHSV. Draw the Isometric view.	10	2,4	3	5
						
Q.5	b.	Draw an involute of a regular hexagon having side 60 mm.	10	1,2	3	1
Q.6	a.	Given is the FV and TV. Draw the following: i. FV ii. TV iii. Missing RHSV	15 03 02 10	2,4	3	5
						
Q.6	b.	A line AB, having length 50 mm, is parallel to H.P. and perpendicular to V.P. Line is 20 mm in front of V.P. and point B is 10 mm above H.P. Draw the projections of line AB.	05	1,3	03	02



Q.7	a. Draw the Isometric View. 	10	2,4	03	05
	b. A square pyramid of 40 mm edge of base and 60 mm axis, has one of the side of base in the H.P. The axis of a solid is inclined to the H.P. and the V.P. at an angle 30° and 60° respectively. Draw its projections considering its apex is nearer to the observer.	10	1,3	03	04



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July
END SEM/RE-EXAM EXAMINATION MAY/JUNE-2026 (Set-2)

First Year

Program: B.Tech. Civil Engineering

Course Code: PC-BTC201

Course Name: Building Materials and Construction

Sem-II

Duration: 3 Hour

Maximum Points: 100

Semester: II

Notes:

1. Attempt *any FIVE questions out of SEVEN* questions
2. Answers to all sub questions should be grouped together
3. Draw neat diagrams wherever required
4. Assume suitable data if necessary and state the clearly.

20/7/26

Q.No.	Questions	Points	CO	BL	Module No.
1	a) Explain the properties of mortar used in plastering work.	05	2	3	01
	b) Discuss in brief basic components of paint.	06	3	1	07
	c. Write a short note on MDF (medium density fibre board)	04	2	2	01
	d. Discuss materials required for manufacturing of concrete.	05	3	1	01
2	a). What are the requirement of good floor?	05	01	1	04
	b). Explain any three types of partition wall.	06	04	2	03
	c. How defects present in bricks are identified?	05	03	3	01
	d. Explain with neat sketch lime cycle.	04	01	2	01
3	a. Explain with neat sketch of Raking shore.	06	02	3	08
	b. Describe in brief methods of timber preservations.	08	03	2	01
	c. Discuss physical and chemical factors affecting stone quality.	06	03	2	01
4	a. Discuss various sources of dampness inside the building?	06	02	3	2
	b. Explain steel formwork with advantages and disadvantages.	06	01	1	4
	c. Explain various types of lintels used in construction.	08	04	1	5
5.	a. Explain in brief different type of defects presents in Timber.	10	02	3	2
	b. Explain with neat sketch Single scaffolding in construction?	06	04	1	3
	c. What are the qualities of good arch?	04	03	2	4



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July
END SEM/RE-EXAM EXAMINATION ~~MAY~~ JUNE-2026 (Set-2)

6	a) Explain the issues related to the storage and handling of lime.	05	3	1	1
	b) Draw neat sketch to show structure of timber and explain components with their function.	06	4	3	1
	c. What are the qualities of good cement?	05	3	2	1
	d. Differentiate between coarse and fine aggregate	04	2	4	1
7	a. Discuss the quality characteristics of good Foundation.	06	1	2	1
	b. Explain the term Slaking and Hydraulicity w.r.t. lime	04	3	2	1
	Write short notes on (any two)	10			
	i. Cement-lime mortar	5	2	1	1
	ii. Types of paints	5	3	2	8
	iii. ASCU Treatment	5	2	1	1
	iv. Plywood	5	2	2	1