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Register Number :

Name of the Candidate :

3 0 0 1

B.E. DEGREE EXAMINATION, 2013

(FIRST SEMESTER)

CLEC-101. TECHNICAL ENGLISH

(*New Pattern*)

(*For the students joined
between 2008-09 and 2010-11*)

November]

[Time : 3 Hours

Maximum : 60 Marks

PART - A (10 × 2 = 20)

Answer ALL the questions.

ALL questions carry EQUAL marks.

1. What is team listening?
2. Write four traits of a good listener.
3. Write down the importance of technical vocabulary.

Turn Over

4. Define skimming and scanning.
5. Transcribe the following words :
 - (a) Teacher.
 - (b) Lawyer.
 - (c) Groom.
 - (d) Eye.
6. *Fill in the blanks with suitable tense.*
 - (a) By the end of this semester, We _____
(pick) up a good practice in technical English writing.
 - (b) He _____ (read) a news paper now.
7. *Fill in the blanks with suitable Article.*

Ram saw _____ dog near _____ tree. Foolish _____ man, offered some chocklites to _____ dog.
8. *Fill in the blanks with suitable prepositions.*
 - (a) To keep _____ arms length.
 - (b) I have _____ reach _____ tomorrow evening.

9. *Complete the following sentences using correct verb.*

(a) Neither the plate nor the glass _____ mine.

(b) Either Ram or his friends _____ to clean the kitchen.

10. *Convert the following sentences into the other voice.*

(a) He has been chasing the dog from the morning.

(b) Metals have been replaced by plastics and ceramics.

PART - B (5 × 8 = 40)

11. (a) Elucidate various modes of communication with appropriate examples.

(OR)

(b) Explain various barriers to communication and give your suggestions to overcome them.

Turn Over

12. (a) Write a letter to the editor of a news paper regarding the increasing stray dogs in your area.

(OR)

- (b) Write a letter to the Commissioner of Police regarding the illegal activities happening in your area.

13. (a) A leading software company calls for Program Officer with minimum of five years experience. Send your Resume with job application letter to the HR Manager.

(OR)

- (b) Mahendra Private Limited requires Mechanical Engineer. Freshers also can apply. Send your Resume with job application letter to the HR Manager.

14. (a) Assume that you are the Section Manager in BHEL and submit a report on the fire accident happened in your section to the head of your company.

(OR)

- (b) Your company is planning to launch a baby skin care product. Conduct a survey with the public and prepare a feasibility report on the same and submit it to your MD.
15. (a) Write an essay on the social responsibilities of Indian students.

(OR)

- (b) Write an essay on the topic "Nature – Neglected".

Register Number :

Name of the Candidate :

3 0 0 2

B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

102. ENGINEERING MATHEMATICS - I

(*New Pattern*)

(*Common to ALL Branches*)

(*For those who joined 2008-09, 2009-10 &
2010-11 Batch only*)

November]

[Time : 3 Hours

Maximum : 60 Marks

PART - A (10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. If 3 and 15 are the two eigen values of

$$A = \begin{bmatrix} 8 & -6 & 7 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix},$$

find $|A|$, without expanding the determinant.

Turn Over

2. Find the stationary points of

$$f(x, y) = x^2 - xy + y^2 - 2x + y.$$

3. Solve :

$$(x^2 D^2 - 3xD) y = 0.$$

4. Solve :

$$(D - 2)^2 y = e^{2x}.$$

5. Evaluate :

$$\int_0^a \int_0^b \int_0^c xyz \, dz \, dy \, dx.$$

6. Prove that the area bounded by a simple closed curve C is

$$\frac{1}{2} \int_C (x dy - y dx).$$

7. Give an example for a function $f(z)$, whose real and imaginary part satisfy the Laplace equation, but $f(z)$ is not an analytic function.

8. Find the residues of the function

$$f(z) = \frac{z-3}{(z+1)(z+2)}$$

at its pole.

9. Without integrating, evaluate :

$$\int_0^{\infty} e^{-4t} \sin 3t \, dt.$$

10. Find:

$$L^{-1} \left[\frac{1}{s^2 (s^2 + 1)} \right].$$

PART - B (5 × 8 = 40)

Answer ALL questions.

ALL questions carry EQUAL marks.

11. (a). (i) If

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix},$$

Turn Over

prove that

$$A^3 - 3A^2 - 9A - 5I = 0$$

using Cayley-Hamilton theorem.

(ii) Discuss the Maxima and Minima of

$$f(x,y) = x^2 + 2xy + 2y^2 + 2x + y.$$

(4+4= 8)

(OR)

(b) (i) Diagonalize the Maxima

$$A = \begin{pmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{pmatrix}$$

by orthogonal transformation.

(ii) Find the circle of curvature at $\left(\frac{3}{4}\right)$ on

$$xy = 12.$$

(4+4= 8)

12. (a) (i) Solve :

$$(D^2 + 4) x = t^2 \sin t.$$

(ii) Solve :

$$y'' - 4y' + 4y = \frac{e^{2x}}{x}$$

by the method of variation parameter.

(4+4=8)

(OR)

(b) (i) Solve :

$$(x^2 D^2 + xD - 9)y = \frac{5}{x^2}.$$

(ii) Solve :

$$Dx + y = \sin t,$$

$$x + Dy = \cos t. \quad (4+4=8)$$

13. (a) (i) Evaluate :

$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz \, dz \, dy \, dx.$$

Turn Over

(ii) Prove that

$$\nabla^2 (r^n \vec{r}) = n(n+3)r^{n-2}\vec{r}. \quad (4+4=8)$$

(OR)

(b) (i) Using Stoke's theorem, show that

$$\int_C yz \, dx + zx \, dy + xy \, dz.$$

equal to zero, where C is the curve

$$x^2 + y^2 = 1,$$

$$z = y^2.$$

(ii) Evaluate :

$$\int_0^2 \int_y^2 \frac{x}{x^2 + y^2} \, dx \, dy$$

by changing the order of integration.

(4+4=8)

14. (a) (i) Find the analytic function whose real part is

$$\frac{2 \sin 2x}{(e^{2y} + e^{-2y} - 2 \cosh 2y)}.$$

(ii) Evaluate :

$$\int_C \frac{(1-2z) dz}{z(z-1)(z-2)}$$

where C is the circle $|z| = \frac{3}{2}$

(4+4=8)

(OR)

(b) (i) Find the image of the following under the mapping $w = e^z$ given,

$$-1 < x < 1,$$

$$-\frac{\pi}{2} < y < \frac{\pi}{2}.$$

(ii) Using Contour integration, evaluate

$$\int_0^{\infty} \frac{dx}{(1+x^2)^2}. \quad (4+4=8)$$

15. (a) (i) Evaluate :

$$L^{-1} \left[\tan^{-1} \frac{2}{(s+1)} \right]$$

and

$$L^{-1} \left[\frac{s^2}{(s^2-4)^2} \right].$$

Turn Over

- (ii) Using Convolution theorem, find the inverse Laplace transform of

$$\frac{1}{s^2 (s^2 + 9)}$$

(4+4=8)

(OR)

- (b) (i) Solve the differential equation,

$$(D^2 + 4D + 4) y = 4e^{-2x},$$

$$y(0) = -1,$$

$$y'(0) = 4$$

by using Laplace transform.

- (ii) Find the Laplace transform of

$$f(t) = \sin t, \text{ when } 0 < t < \pi$$

$$= 0, \text{ when } \pi < t < 2\pi$$

and $f(t)$ is periodic with period 2π .

(4+4=8)

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B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

103. ENGINEERING PHYSICS

(*New Pattern*)

(*For the students joined between 2008-09
and 2010-11.*)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

PART - A (10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. State Hook's law?
2. Define magnetostriction effect.

Turn Over

3. Explain the classification of optical fibers based on the materials.
4. State Stress Optic Law.
5. Define unit cell.
6. What is Schottky defect?
7. What is meant by Superconductivity?
8. What are the different forms of nanomaterial?
9. What is Matter wave?
10. Define Chain reaction.

PART - B (5 × 8 = 40)

*Answer FIVE questions,
choosing ONE FULL question from each unit.
ALL questions carry EQUAL marks.*

UNIT - I

11. Explain how you will determine the coefficient of viscosity of a liquid by Stoke's method? (8)

(OR)

12. Derive an expression for Sabine's mathematical relation for reverberation time. (8)

UNIT - II

13. Explain with a neat sketch the construction and reconstruction of a holography using laser beam. (8)

(OR)

14. Explain the construction and working of a Michelsons interferometer. (8)

UNIT - III

15. What is Miller indices? How will you determine the Miller indices of a given plane? (8)

(OR)

16. Write a short note on F and E colour centers. (8)

UNIT - IV

17. Derive an expression for electrical conductivity based on free electron theory. (8)

(OR)

Turn Over

18. Derive a mathematical expression for determining density of holes and electrons. (8)

UNIT - V

19. Derive the Schrodinger time independent and time dependent wave equation. (8)

(OR)

20. Explain briefly the construction and working of a nuclear reactor. (8)

Register Number :

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B.E. DEGREE EXAMINATION, 2013

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

(FIRST SEMESTER)

106. BASIC ENGINEERING

*(For the candidates of 2008-09 batch
to 2010-11)*

November]

[Time : 3 Hours

Maximum : 60 Marks

CIVIL ENGINEERING (20)

Section – I Answer ALL questions.

Section – II Answer any ONE FULL questions.

SECTION – I

1. Name the different types of cement. (3)
2. Write the different types of surveying. (4)
3. What are the necessity of bridges? (3)

Turn Over

SECTION - II

4. (a) What are the characteristics of good brick?
(3)

(b) The following consecutive readings were observed using 4 m levelling staff. First reading was taken on a bench mark 105.450. The readings are given below. Calculate the reduced level of the last station.

1.750, 2.800, 3.255, 0.575, 1.025 (7)

(OR)

5. (a) Explain in detail the uses of traffic sign.
(4)

(b) With a neat sketch explain slow sand filter.
(6)

MECHANICAL ENGINEERING (20)

Section - I. Answer ALL questions.

Section - II. Answer any TWO FULL questions.

SECTION - I (3×2=6)

1. Define welding.
2. What is the function of a carburetor?
3. State four advantages of belt drives.

SECTION - II (2 × 7 = 14)

4. With the help of a neat sketch explain the working of Locomotive boiler.
5. Explain the construction and working principle of a two stroke petrol engine with neat sketch.
6. Draw and explain shielded metal arc welding.

Turn Over

ELECTRICAL ENGINEERING (20)

Section – I. Answer ALL questions.

Section – II. Answer any TWO FULL questions.

SECTION – I (3 × 2 = 6)

1. Define real power.
2. What is the need for earthing?
3. Draw the symbol and truth table for NOT gate.

SECTION - II (2 × 7 = 14)

4. A series RL circuit with $R = 25$ ohms, and $L = 0.02$ henry is connected to a 250 volt, 50Hz source. Calculate
 - (a) the impedance,
 - (b) current,
 - (c) powerand (d) power factor.
5. Describe the construction and working principle of different types of three phase induction motor.
6. Explain the function of Zener diode as voltage regulator with its characteristics.

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B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

107. ENVIRONMENTAL STUDIES

(*New Pattern*)

[*For those who joined between
2008-09 and 2010-11*]

November]

[Time : 3 Hours

Maximum : 60 Marks

PART - A (10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. List the major natural resources which exist in our earth.
2. Name the various layers of atmosphere.
3. Define food chain and food web.

Turn Over

4. Classify ecosystem.
5. What do you mean by Red Data book?
6. What is hot spot? List the hot spots available in India.
7. Identify some sources of air pollution.
8. Suggest any four nuclear hazards.
9. Define water shed management.
10. List some applications of GIS.

PART – B (5 × 8 = 40)

*Answer any ONE FULL question from each unit.
ALL questions carry EQUAL marks.*

UNIT – I

1. Discuss in detail on :
 - (i) Soil Erosion. (4)
 - (ii) Desertification. (4)

(OR)

2. Explain in detail on various renewable energy resources on earth. (8)

UNIT - II

3. Explain with illustration :
- (i) Water cycle. (4)
 - (ii) Nitrogen cycle. (4)

(OR)

4. Discuss :
- (i) Ecological pyramids. (4)
 - (ii) Desert ecosystem. (4)

UNIT - III

5. What are the four kinds of diversity? Explain. (8)

(OR)

6. Define the term 'Hotspot' in Biodiversity. Discuss the salient features of hotspots found in India. (8)

Turn Over

UNIT – IV

7. Discuss the role of an individual to prevent the various pollution. (8)

(OR)

8. What is meant by hazardous waste and how to manage hazardous waste? (8)

UNIT – V

9. (i) Discuss the resettlement and rehabilitation issues. (4)

- (ii) Discuss the salient features of Wildlife Act. (4)

(OR)

10. Discuss the role of information technology in environment and human health. (8)

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3 0 0 9

B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

102. ENGINEERING MATHEMATICS - I

(Revised Pattern)

(Common to ALL Branches)

November]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for the students who
joined 2007-08 only)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. (a) Find the eigen values and eigen vectors
of the matrix

$$\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$$

(7)

Turn Over

(b) Reduce the quadratic form

$$3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$$

to the Canonical form by orthogonal transformation. (8)

(OR)

2. (a) If $u = x^2 - 2y$,

$$v = x + y + z,$$

$$w = x - 2y + 3z,$$

find :

$$\frac{\partial (u, v, w)}{\partial (x, y, z)}. \quad (7)$$

(b) Show that the evolute of the cycloid

$$x = a (\theta - \sin\theta),$$

$$y = a (1 - \cos\theta)$$

is another cycloid. (8)

UNIT - II

3. (a) Solve :

$$(D^3 - 6D^2 + 11D - 6) y = e^{-2x} + e^{-3x}. \quad (7)$$

(b) Solve by the method of variation of parameters.

$$\frac{d^2y}{dx^2} + 4y = \tan 2x. \quad (8)$$

(OR)

4. (a) Solve :

$$x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + y = \log x. \quad (7)$$

(b) The differential equation for a circuit in which self-inductance and capacitance neutralize each other is

$$L \frac{d^2I}{dt^2} + \frac{I}{C} = 0.$$

Find the current I as a function of t given that I is the maximum current and $I = 0$ when $t = 0$. (8)

Turn Over

4

UNIT - III

5. (a) Evaluate :

$$\int_0^1 \int_0^2 \int_0^2 x^2 yz \, dx \, dy \, dz. \quad (7)$$

(b) Change the order of integration in

$$\int_0^1 \int_{x^2}^{2-x} xy \, dx \, dy$$

and hence evaluate. (8)

(OR)

6. (a) Prove that

$$\nabla r^n = nr^{n-2} \vec{r},$$

where

$$\vec{r} = x\vec{i} + y\vec{j} + z\vec{k}. \quad (7)$$

(b) Verify Gauss divergence theorem for

$$\vec{F} = 4xz \vec{i} - y^2 \vec{j} + yz \vec{k},$$

taken over the cube bounded by

$$x = 0, x = 1,$$

$$y = 0, y = 1,$$

$$z = 0 \text{ and } z = 1. \quad (8)$$

UNIT - IV

7. (a) If $f(z)$ is a regular function of z , prove that

$$\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \right) |f(z)|^2 = 4|f'(z)|^2. \quad (7)$$

(b) Discuss the mapping of $w = \sin z$. (8)

(OR)

8. (a) Expand

$$f(z) = \frac{1}{(z-1)(z-2)}$$

in the region $|z| < 1$ as Taylor's series.

(7)

(b) Apply the calculus of residues, to prove that

$$\int_0^{2\pi} \frac{\cos 3\theta}{5-4\cos\theta} d\theta = \frac{\pi}{12}. \quad (8)$$

UNIT - V

9. (a) Find :

$$L^{-1} \left\{ \log \left(\frac{s+1}{s-1} \right) \right\}. \quad (7)$$

(b) Find the Laplace transform of :

(i) $e^{-3t} (2\cos 5t - 3\sin 5t)$.

(ii) $e^{4t} \sin 2t \cdot \cos t$. (8)

(OR)

10. (a) Using convolution theorem evaluate :

$$L^{-1} \left[\frac{s^2}{(s^2+a^2)(s^2+b^2)} \right]. \quad (7)$$

(b) Solve :

$$y'' - 3y' + 2y = 4t + e^{3t},$$

when $y(0) = 1$

and $y'(0) = -1$

by using Laplace transforms. (8)

Register Number :

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3 0 0 4

B.E. DEGREE EXAMINATION, 2013

(COMMON TO ALL BRANCHES)

(SECOND SEMESTER)

104. ENGINEERING CHEMISTRY

(*New Pattern*)

(*For the students joined between
2008-09 and 2010-11*)

November]

[Time : 3 Hours

Maximum : 60 Marks

PART - A (10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. What are the types of hardness?
2. Define acid rain.
3. What are polymers?

Turn Over

4. Define absorption isotherm.
5. Define octane number.
6. Give any two applications of solar cells.
7. What is meant by electrochemical cell? Give an example.
8. Define wet corrosion.
9. What are abrasives?
10. Define the term nanomaterials.

PART – B (5 × 8 = 40)

*Answer ONE FULL question from each unit.
ALL questions carry EQUAL marks.*

UNIT – I

11. (a) Describe the determination of total hardness by EDTA method.
- (b) Explain causes, sources and effects of water pollution.

(OR)

12. (a) Explain the determination of dissolved oxygen by volumetric method.
- (b) Give an account of green house effect.

UNIT – II

13. (a) Give the preparation, properties and types of cellulose derivatives and Nylon – 6, 6.
- (b) Derive Langmuir absorption isotherm.

(OR)

14. (a) Explain the mechanism of free radical mechanism of addition polymerization.
- (b) Explain the factors influencing on absorption of ions from solution.

UNIT – III

15. (a) Explain the construction and working of a solar cell with a diagram.
- (b) Deduce the expression for theoretical calculation of air by volume required for complete combustion of a fuel.

(OR)

Turn Over

16. (a) Discuss the proximate analysis of coal.
(b) Give an account of solar cells.

UNIT - IV

17. (a) Describe the construction and working of galvanic cell.
(b) Explain the mechanism of dry corrosion.

(OR)

18. (a) Discuss about the construction and working of lead acid cell.
(b) Explain the galvanization and tinning process.

UNIT - V

19. (a) What are refractories? Discuss about the properties of refractories.
(b) Write short notes on Fullerenes and semiconductor sensors.

(OR)

20. (a) Explain the properties of lubricants.
(b) Discuss the applications of carbon nano-tubes.

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B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

105. ENGINEERING MECHANICS

(*New Pattern*)

(*Common to ALL Branches*)

(*For those who joined 2008-09 to 2010-11*)

November]

[Time : 3 Hours

Maximum : 60 Marks

Answer ALL questions.

ALL questions carry EQUAL marks.

PART - A (10 × 2 = 20)

1. Distinguish the following system of forces with a suitable sketch :

(a) Coplanar.

(b) Collinear.

Turn Over

2. State Lami's theorem with a sketch
3. State Varignon's theorem.
4. What is a couple? What is a moment of a couple?
5. State parallel axis theorem.
6. Distinguish between centroid and centre of gravity.
7. What is principal stress and principal strain?
8. How will you find volumetric strain?
9. Define mechanical advantage.
10. Define velocity ratio and efficiency.

PART - B (5×8 = 40)**UNIT - I.**

11. Determine the resultant of the concurrent force system shown in the following figure-1. (8)

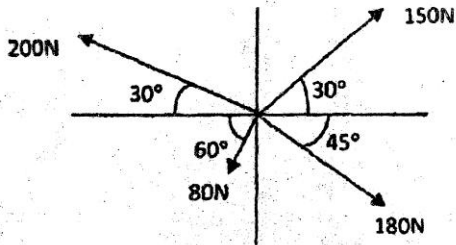


Figure-1

(OR)

12. The following figure-2 shows a 10 kg lamp supported by two cables AB and AC. Find the tension in each cable. (8)

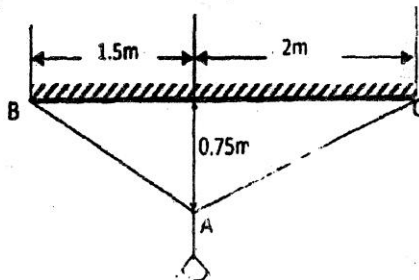


Figure -2

Turn Over

UNIT - II

13. A force couple system acting on a rectangular plate is shown in figure-3. Find the equivalent force-couple system at the origin O. (8)

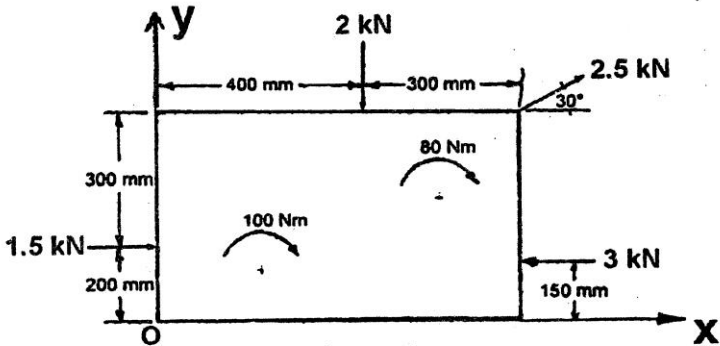


Figure-3

(OR)

14. The slab shown in figure-4 is subjected to parallel forces. Determine the magnitude and direction of the resultant force equivalent to the given force system and locate its point of application on the slab. (8)

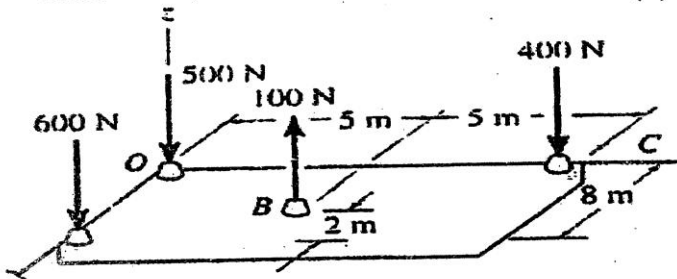


Figure-4

UNIT - III

15. Find the moment of inertia of the shaded area shown in figure-5 about the vertical and horizontal centroidal axes. The width of the hole is 200 mm. (8)

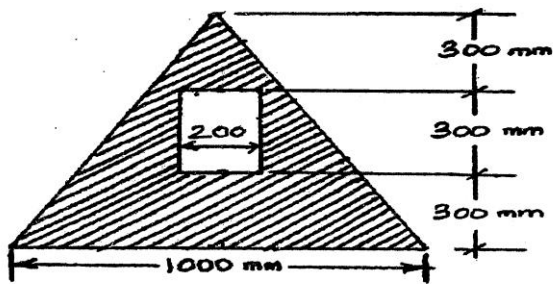


Figure-5

(OR)

16. Determine the co-ordinates of the centroid of the shaded area shown in figure-6. (8)

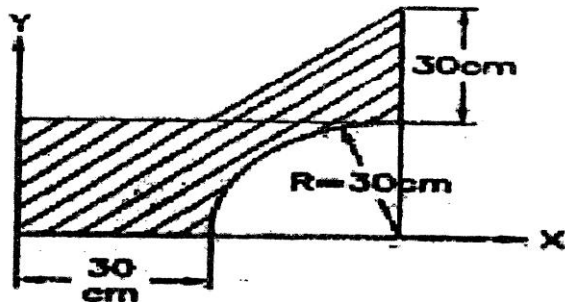


Figure-6

Turn Over

UNIT - IV

17. A reinforced concrete column is 30 cm × 30 cm in section. The column is provided with 8 bars of 20 mm diameter. The column carries a load of 250 kN. Find the stresses in concrete and steel bars.

Take $E_s = 2.1 \times 10^5 \text{ N/mm}^2$.

$$E_c = 0.14 \times 10^5 \text{ N/mm}^2. \quad (8)$$

(OR)

18. An elemental cube is subjected to tensile stress of 30 N/mm^2 and 10 N/mm^2 acting on two mutually perpendicular planes and a shear stress of 10 N/mm^2 on these planes. Draw the Mohr's circle of stresses and hence, determine the magnitudes and direction of principal stresses. (8)

UNIT - V

19. The number of teeth on the worm wheel of a single threaded worm and worm wheel is 60. Calculate the velocity ratio if the diameter of effort wheel is 25 cm. and that of load drum is 12.5 cm. The

effort required to lift a load of 600 N by this machine is 20 N. Find the efficiency of the machine. (8)

(OR)

20. A simple screw jack has a diameter of 50 mm, threads of pitch 5 mm and handle of 45 cm length. Find its velocity ratio. If an effort of 100 N applied at the end of the handle lifts a load of 12,000 N, find the efficiency of the jack. (8)

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B.E. DEGREE EXAMINATION, 2013

(FIRST YEAR)

103. ENGINEERING PHYSICS

(Revised Pattern)

*[For those who joined during 2011-12
and later]*

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. (a) Derive the expression for the time period of a torsional pendulum. (8)
- (b) Distinguish between uniform and non-uniform bending. (7)

(OR)

Turn Over

2. (a) Derive an expression for Sabine's mathematical relation for reverberation time. (8)
- (b) Explain how are the ultrasonic waves are produced using a piezoelectric oscillator. (7)

UNIT - II

3. (a) Explain the construction and working of semiconductor laser. (8)
- (b) Draw a neat block diagram of fiber optics communication system. (7)

(OR)

4. (a) Describe the construction and working of Michelson interferometer. (8)
- (b) Write a short note on the resolving power of a prism. (7)

UNIT - III

5. (a) What is packing factor? Calculate the Packing fraction of FCC. (8)

- (b) What are Miller indices? How will you determine the Miller indices of a given plane? (7)
6. (a) Explain the construction and working of Laue method. (8)
- (b) Write a short note on Frenkel defect. (7)

UNIT - IV

7. (a) Derive an expression for thermal conductivity based of electron in metal? (8)
- (b) Write a short not on type - I and type - II superconductor. (7)

(OR)

8. (a) Distinguish between N-types, P-types semiconductor. (7)
- (b) Derive an expression for carrier concentration in N-type. (8)

Turn Over

UNIT - V

9. (a) Explain the construction and working of Davission and Germer experiment method. (8)
- (b) Derive the Schrodinger time independent wave equation. (7)

(OR)

10. (a) Explain the construction and working of G.M. counter. (8)
- (b) Write a short note on the interstellar energy processor. (7)

Register Number :

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B.E. DEGREE EXAMINATION, 2013

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

104. ENGINEERING CHEMISTRY

(Revised pattern)

(For those joined 2011-12 and after)

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

1. (a) Discuss the ion exchange process of
dimineralation of water. (7)
- (b) Define BOD. Explain the determination of
BOD in sewage water. (8)

(OR)

Turn Over

2. (a) Explain the determination of total hardness by EDTA method. (7)
- (b) Explain the causes and effects of acid rain. (8)

UNIT - II

3. (a) Give the preparation, properties and uses of cellulose derivatives and Nylons. (7)
- (b) Derive the Langmuir absorption isotherm. (8)

(OR)

4. (a) Differentiate the addition from condensation polymerization. (7)
- (b) Explain the factors influencing of gases on solids. (8)

UNIT - III

5. (a) Discuss about the proximate analysis of coal. (7)
- (b) Explain the flue gas analysis of ORSAT's apparatus. (8)

(OR)

6. (a) Explain the construction and working of photovoltaic cell. (7)
- (b) Discuss the process of refining of petroleum. (8)

UNIT - IV

7. (a) Describe the construction and working principle of $H_2 - O_2$ fuel cell. (7)
- (b) Explain the
- (i) Anodizing.
- (ii) Phosphate metal coating. (8)

(OR)

8. (a) Explain the construction and working of concentration cells. (7)
- (b) Give an account of Tinning and Galvanizing. (8)

Turn Over

UNIT - V

9. (a) What are abrasives? Write the preparation, properties and uses of synthetic abrasives.

(7)

(b) Discuss the applications of carbon nano-tubes.

(8)

(OR)

10. (a) Give any four properties of refractories.

(8)

(b) Write a note on Fullerene.

(8)

Register Number :

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3 0 1 2

B.E. DEGREE EXAMINATION, 2013

(ANNUAL PATTERN)

(FIRST YEAR)

105. ENGINEERING MECHANICS

(Revised Pattern)

November]

[Time : 3 Hours

Maximum : 75 Marks

*(Maximum 60 Marks those who joined before
2007-08 only)*

Answer any ONE FULL question from each unit.

Assume suitable data wherever necessary.

EACH question carries FIFTEEN marks.

Turn Over

UNIT - I

1. A pre-cast concrete post weighing 50 kg and of length 6 m shown in figure-1 is raised for placing it in position by pulling the rope attached to it. Determine the tension in the rope and the reaction at A. (15)

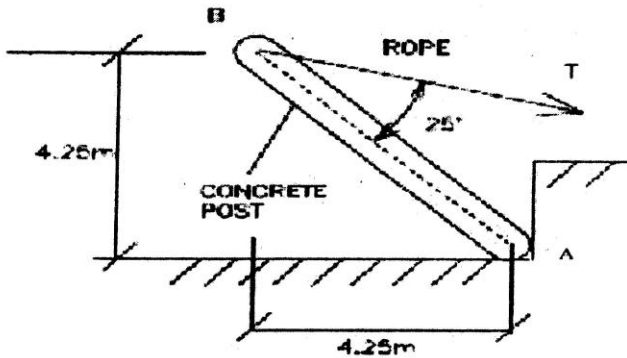


Figure-1

(OR)

2. A tower guy wire shown below is anchored by means of a bolt at A as shown in figure-2. The tension in the wire is 2,500 kN. Determine :

- The components F_x , F_y and F_z of the force acting on the bolt.
- The angles α_x , α_y , α_z defining the direction of the force. (15)

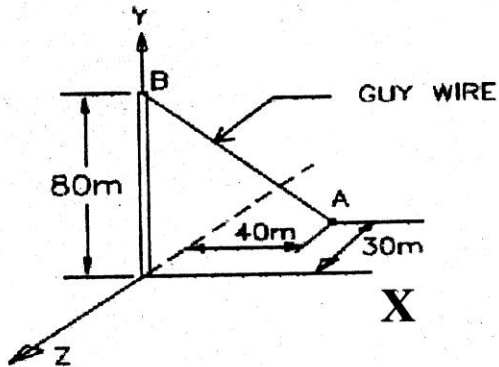
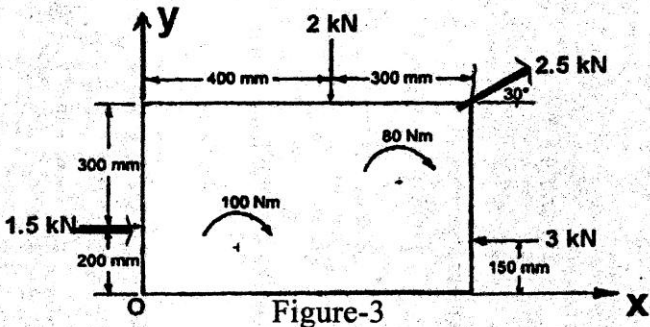


Figure-2

Turn Over

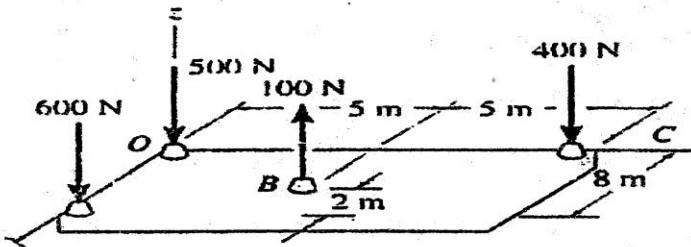
UNIT - II

3. A force couple system acting on a rectangular plate is shown in figure-3. Find the equivalent force couple system at the origin O. (15)



(OR)

4. The slab shown in figure-4 is subjected to parallel forces. Determine the magnitude and direction of the resultant force equivalent to the given force system and locate its point of application on the slab. (15)



UNIT - III

5. Find the moment of inertia of the shaded area shown in figure-5 about its horizontal centroidal axis. (15)

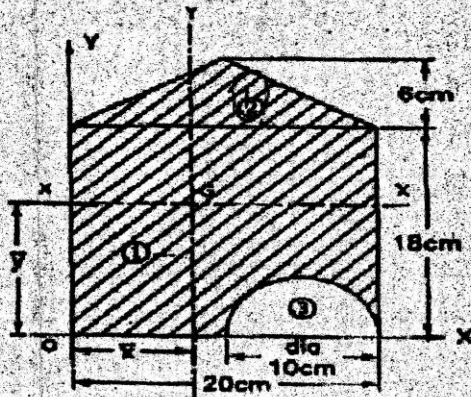


Figure-5

(OR)

6. A cylinder of height of 10 cm and radius of base 4 cm is placed under sphere of radius 4 cm such that they have a common vertical axis. If both of them are made of the same material, locate the centre of gravity of the combined unit. (15)

Turn Over

UNIT - IV

7. For a given material, the Young's modulus is $1.1 \times 10^5 \text{ N/mm}^2$ and modulus of rigidity is $0.43 \times 10^5 \text{ N/mm}^2$. Determine the bulk modulus and lateral contraction of a round bar of 50 mm diameter and 30 m length when stretched by 3 m. (15)

(OR)

8. An elemental cube is subjected to tensile stress of 40 N/mm^2 and 15 N/mm^2 acting on two mutually perpendicular planes and a shear stress of 20 N/mm^2 on these planes. Draw the Mohr's circle of stresses and hence, determine the magnitude and direction of principal stresses. (15)

UNIT - V

9. A weight of 460 N is to be raised by a wheel and axle. The axle is 10 cm diameter and wheel is 40 cm diameter. If a force of 120 N has to be applied to the wheel,

Find :

- (a) mechanical advantage.
- (b) velocity ratio.
- (c) efficiency of the machine. (15)

(OR)

10. In a lifting machine with a velocity ratio 25, a load of 2,000 N is lifted by an effort of 150 N and a load of 2,500 N by an effort of 180 N. Find the law of machine. What effort is required to lift a load of 3,750 N?

Calculate also,

- (a) effort wasted in friction.
- (b) the mechanical advantage.
- (c) the efficiency at the load.

Find the maximum possible efficiency of the machine. (15)

Register Number :

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B.E. DEGREE EXAMINATION, 2013

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

(FIRST SEMESTER)

CLEC-106. BASIC ENGINEERING

(For the candidates 2011-12 batch and later)

November]

[Time : 3 Hours

Maximum : 75 Marks

CIVIL ENGINEERING (25)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

Turn Over

UNIT – I

1. (a) List the qualities of good bricks. (9)
- (b) Define the following : (4)
 - (i) True bearing.
 - (ii) Bench marks.

(OR)

2. (a) Describe the properties of concrete. (9)
- (b) List the classification of surveys. (4)

UNIT – II

3. (a) Name the classifications of bridges. (4)
- (b) Describe any four water treatment methods. (8)

(OR)

4. (a) Name the classification of dams and explain any three. (8)
- (b) Define the following : (4)
 - (i) Per capita consumption.
 - (ii) Bio-chemical Oxygen Demand. (B.O.D.)

MECHANICAL ENGINEERING (25)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

5. (a) Differentiate between boiler mountings and boiler accessories. (5)
- (b) With neat sketch, explain the working principle of Impulse and Reaction turbines. (8)

(OR)

6. (a) Compare petrol and diesel engines. (5)
- (b) Draw and explain the working principle of Fuel Injector. (8)

UNIT - II

7. (a) Write short note on gear drives. (5)
- (b) Explain the types of rolling mills with a neat sketch. (7)

(OR)

Turn Over

8. (a) Define welding and list some of its common applications. (5)
- (b) Draw and explain the equipment of gas welding. (7)

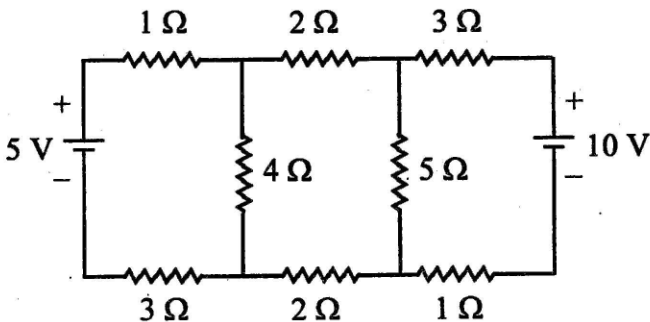
ELECTRICAL (25)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT - I

9. Obtain the currents in all the branches of the network shown by Mesh Method. (13)



(OR)

10. Describe the construction and working principle of Synchronous Motor. (13)

UNIT – II

11. Explain the function of thyristor with circuit diagram and characteristics. (12)

(OR)

12. Draw the block diagram of radio communication system and explain. (12)

Register Number :

Name of the Candidate :

3 0 1 4

B.E. DEGREE EXAMINATION, 2013

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

107. ENVIRONMENTAL STUDIES

(*Revised Pattern*)

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. Write in detail about Timber extraction, mining, dams and their effects on forests. (15)

(OR)

Turn Over

2. (a) Discuss the development of Modern Energy resources and its effects. (7)
- (b) List the causes of soil erosion and explain the methods of preventing it. (8)

UNIT – II

3. Explain the structure and function of an ecosystem and energy flow in the ecosystem. (15)

(OR)

4. Discuss the characteristic features, structures and function of forest, grass land and desert ecosystem. (15)

UNIT – III

5. Define biodiversity. Explain the classification and values of biodiversity. (15)

(OR)

6. Explain the various threats to biodiversity and the measures recommended for the conservation of biodiversity. (15)

UNIT – IV

7. Write briefly about the causes, effects and control measures of air pollution. (15)

(OR)

8. Discuss the development of disaster management. Floods, earthquake, cyclone and landslides. (15)

UNIT – V

9. Discuss in detail about water conservation, rain water harvesting and watershed management. (15)

(OR)

10. Write in detail about the objectives and laws that have been framed for environmental protection. (15)