

Register Number :

Name of the Candidate :

0 1 0 1

B.E. DEGREE EXAMINATION, 2014

(Common to All Branches)

(FIRST YEAR)

101. TECHNICAL ENGLISH

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

May]

[Time : 3 Hours

Maximum : 60 Marks

PART - A

(10 × 2 = 20)

Answer ALL questions.

1. Define Non-verbal communication.
2. Who is an active listener ?
3. Write two oxymorons which we use in daily communication.
4. *Transcribe the following :*
 - (a) Good.
 - (b) Food.
 - (c) Knife.
 - (d) College.
5. *Change the following Adjectives into Nouns :*
 - (a) Anxious .
 - (b) True.
 - (c) Safe.
 - (d) Good.
6. *Fill in the blanks with suitable Tense :*
 - (a) I _____ (come) just now. (present perfect)
 - (b) He _____ (paint) the house. (past perfect)
7. *Form question tag for the following :*
 - (a) We can adjust.

Turn Over

(b) The parcel will arrive today.

8. Fill-in the blanks with suitable Article :

(a) Poverty is one of _____ problems of India.

(b) He is _____ Indian.

9. Combine the sentences using co-ordinating conjunctions :

(a) My father sent me books. I received them yesterday.

(b) She wants to play Tennis. She wants to play volley ball.

10. Identify the parts of Speech :

My friend gave me a gift yesterday.

PART - B

(5 × 8 = 10)

Answer ALL questions

ALL questions EQUAL marks.

11. (a) Write on the following :

(a) Barriers to Listening (b) Tips to overcome the barriers of Listening.

(OR)

(b) Explain the features of non-verbal communication.

12. (a) Write a letter to the Editor of a newspaper about the frequent road accident in your area, quoting the reasons and your suggestions.

(OR)

(b) Write a letter to the Director of the Electricity Board requesting for additional street lights in your area.

13. (a) A leading electronics company needs marketing executives. Apply with your Resume.

(OR)

(b) "Wanted Electrical Engineers. Freshers also can apply Salary negotiable". Respond to the advertisement by sending your CV and job application letter.

14. (a) Write an essay on the increasing number of Engineering Colleges : Scope of Engineers and the alternatives.

(OR)

(b) Write an essay on Global Warming.

15. (a) As a Principal of an Engineering College, submit a detail report to the Chairman of the college, stating the need for starting two new courses in the next academic year. Also, write your suggestions and recommendations.

(OR)

(b) You are the Branch Manager of a reputed Software Company and you want to furnish your Branch Office. Write a detailed report to the HR Manager of your company.

Register Number :

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0 1 0 2

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

105. ENGINEERING MATHEMATICS - I

(New Pattern)

(For those who joined between 2008-09 and 2010-11)

May]

[Time : 3 Hours

Maximum : 60 Marks

PART - A

(10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. Find the eigen values of adj A, if $A = \begin{pmatrix} 3 & 5 & 3 \\ 0 & 4 & 6 \\ 0 & 0 & 1 \end{pmatrix}$.
2. Find the radius of curvature at any point (0, 1) of the curve $y = c \cos h \left(\frac{x}{c} \right)$.
3. Find the particular integral of $(D^2 - 6D + 9) y = 3^x$.
4. Evaluate the complementary function value of $(D^3 - 1) y = \cos \frac{x}{2} \cdot \sin \frac{x}{2}$.
5. Change the order of integration $\int_0^1 \int_{x^2}^{2-x} xy \, dy \, dx$ only.

Turn Over

6. Find the constant a, b, c so that the vector

$$\vec{A} = (axy + bz^2) \vec{i} + (3x^2 - cz) \vec{j} + (3xz^2 - y) \vec{k} \text{ is irrotational.}$$

7. Prove that $f(z) = z^n$ is an analytic function and also find $f'(z)$.

8. Expand $f(z) = \sin z$ in a Taylor's series about $z = \frac{\pi}{4}$.

9. State the convolution theorem on Laplace transform.

10. Evaluate : $L^{-1} \left[\frac{1}{s^4 - 1} \right]$.

PART - B

(5 × 8 = 40)

Answer ALL questions.

ALL questions carry EQUAL marks.

11. (a) (i) Verify Cayley Hamilton theorem for $A = \begin{pmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{pmatrix}$.

(ii) Show that the radius of curvature at the point (x, y) on the curve

$$x^{2/3} + y^{2/3} = a^{2/3} \text{ is } 3(a xy)^{1/3}. \quad (4+4=8)$$

(OR)

(b) (i) Reduce the quadratic form $xy + yz + zx$ to canonical form by orthogonal transformation. (4)

(ii) If $u = x + y + z$, $uv = y + z$, $z = uvw$, find $\frac{\partial (x, y, z)}{\partial (u, v, w)}$. (4)

12. (a) (i) Solve: $(D^2 + 4D + 4)y = x^2 e^{-2x} + e^{-x} \sin 2x$. (4)

(ii) Solve :

$$\frac{dx}{dt} - 2y = \cos 3t,$$

$$\frac{dy}{dt} + 2x = \sin 3t.$$

(4+4=8)

(OR)

(b) (i) The equation for the bending of a strut with a lateral load is

$$\frac{d^2y}{dx^2} + \frac{p}{EI} y = Q(1-x),$$

if $EI n^2 = p$, obtain the deflection y of the strut.

(ii) Solve : $x^2 y'' + 4xy' + 2y = e^x$.

(4+4=8)

13. (a) (i) Find the smaller of the area bounded by $y = 2 - x$ and $x^2 + y^2 = 4$.

(ii) Prove that $\nabla^2 f(r) = f''(r) + \frac{2}{r} f'(r)$.

(4+4=8)

(OR)

(b) (i) Change the order of integration and hence find the value of

$$\int_0^a \int_0^y \frac{x+y}{x^2+y^2} dx dy.$$

(ii) Using Green's theorem in the plane for $\int_c (xy + y^2) dx + x^2 dy$,

where c is the closed curve of the region bounded by $y = x$, $y = x^2$.

(4+4=8)

Turn Over

14. (a) (i) Prove that an analytic function with constant modulus is constant.

(ii) Evaluate $\int_0^{2\pi} \frac{d\theta}{2 + \cos \theta}$, by using contour integration. (4+4=8)

(OR)

(b) (i) Find the image of $|z - 2i| = 2$ under the transformation $w = \frac{1}{z}$.

(ii) Expand $\frac{7z - 2}{z(z - 2)(z + 1)}$ in Laurent's series valid in the annulus $1 < |z + 1| < 3$.

(4+4=8)

15. (a) (i) Find the Laplace transform of

$$f(t) = t \text{ for } 0 < t < \pi \quad \text{and} \quad f(t + 2\pi) = f(t).$$

$$\pi - t \text{ for } \pi < t < 2\pi.$$

(ii) Find : $L^{-1} \left[\log \left(\frac{s(s + a)}{s^2 + a^2} \right) \right]$ (4+4=8)

(OR)

(b) (i) Solve : $(D^2 - 3D + 2)y = 1 - e^{2t}$, $y = 1$, $\frac{dy}{dt} = 0$ when $t = 0$.

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

$$L^{-1} \left[\frac{1}{(s^2 + 1)(s + 1)} \right] \quad (4+4=8)$$

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0 1 0 3

B.E. DEGREE EXAMINATION, 2014

(Common To ALL)

(FIRST YEAR)

103. ENGINEERING PHYSICS

[For the students joined from 2008-09 to 2011-12]

May]

[Time : 3 Hours

Maximum : 60 Marks

PART - A

(10 × 2 = 20)

Answer ALL the questions.

ALL questions carry EQUAL marks.

1. State Stokes law.
2. Define Stress.
3. Mention any two uses of Ruby laser.
4. State Stress optic law.
5. Define Atomic radius.
6. What is Schottky defect ?
7. Define thermal conductivity.
8. What are the different forms of nano-material ?
9. State uncertainty principle.
10. Define nuclear fission.

Turn Over

PART - B

(5 × 8 = 40)

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

UNIT - I

11. Derive a Poisuilli equation. (8)

(OR)

12. Derive an expression for Sabines mathematical relation for reverberation time. (8)

UNIT - II

13. Explain with a neat sketch the construction and reconstruction of Nd-YAG laser. (8)

(OR)

14. Explain the construction and working of a photo elastic bench. (8)

UNIT - III

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

(OR)

16. Calculate the packing factor FCC and BCC. (8)

UNIT - IV

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

(OR)

18. Explain briefly the type-1 and type-II super conductor and any two uses. (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 ionization chamber. (8)

Register Number :

Name of the Candidate :

0 1 0 4

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL)

(FIRST YEAR)

104. ENGINEERING CHEMISTRY

(New Pattern)

[For the students joined from 2008-09 batch to 2011-12]

May]

[Time : 3 Hours

Maximum : 60 Marks

PART - A

(10 × 2 = 20)

Answer ALL questions.

ALL questions carry EQUAL marks.

1. Differentiate temporary from permanent hardness.
2. Define ozone layer depletion.
3. Define degree of polymerization.
4. Define adsorption and desorption.
5. What is meant by knocking ?
6. Write any two applications of solar cells.
7. Define wet corrosion.
8. Define anodizing
9. What are refractories ?
10. What are carbon nano tubes ?

Turn Over

PART - B

(5 × 8 = 40)

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

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

(OR)

12. (a) Explain the method of internal treatment of boiler feed water.
(b) Write short notes on photo chemical smog.

UNIT - II

13. (a) Derive the expression of Langmuir adsorption isotherm.
(b) Write the preparation, properties and uses of polyester resins and silicone resins.

(OR)

14. (a) Explain the adsorption of gases on solid.
(b) Explain the mechanism of free radical polymerization.

UNIT - III

15. (a) Describe the ultimate analysis of coal (any two).
(b) Discuss the principle and application of solar cells.

(OR)

16. (a) Discuss about refining of petroleum.
(b) Explain the causes, mechanism and prevention of knocking of petrol in IC engines.

UNIT - IV

17. (a) Describe the construction and working of electro-chemical cell.

(b) Describe the mechanism of wet corrosion.

(OR)

18. (a) Discuss about Galvanization and tinning process.

(b) Write short notes on :

(i) Sacrificial anodic protection.

(ii) Impressed current cathodic protection method.

UNIT - V

19. (a) Discuss about the properties of Lubricants.

(b) Explain the various preparations of nano-materials.

(OR)

20. (a) Give the preparation, properties and uses of abrasives.

(b) Write short notes on carbon nano-tube Fullerene.

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0 1 0 5

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

105. ENGINEERING MECHANICS

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

May]

[Time : 3 Hours

Maximum : 60 Marks

Answer ALL questions.

ALL questions carry EQUAL marks.

PART - A

(10 × 2 = 20)

1. State parallelogram law and triangle law of forces.
2. Distinguish between units and dimensions. Give examples.
3. Sketch the different types of supports.
4. Write down the conditions of equilibrium of a particle in space.
5. State perpendicular axis theorem.
6. Define polar moment of inertia.
7. Explain tensile and compressive stresses.
8. Define principal stress.
9. Explain law of machine.
10. Define effort and load.

Turn Over

PART - B

(5 × 8 = 40)

UNIT - I

11. Determine the tension in the cables AB and AC to hold 40 kg load shown in figure- 1. (8)

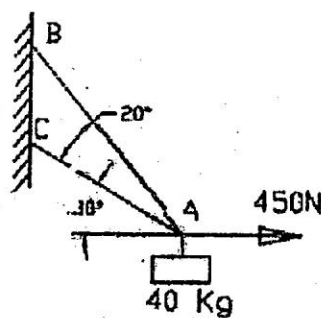


Figure- 1

(OR)

12. A force P is applied at 'O' to the string AOB as shown in figure-2. If the tension in each part of the string is 50 N, find the direction and magnitude of force P for equilibrium conditions. (8)

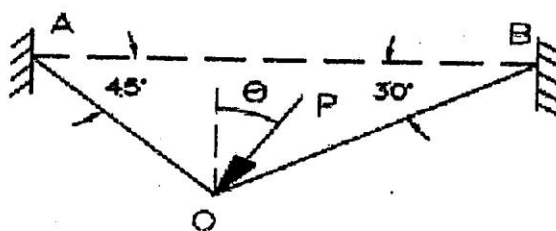


Figure-2

UNIT - II

13. Two beams AB and CD are shown in figure-3. A and D are hinged supports. B and C are roller supports. Sketch the free body diagram of the beam AB and determine the reactions at the supports A and B. (8)

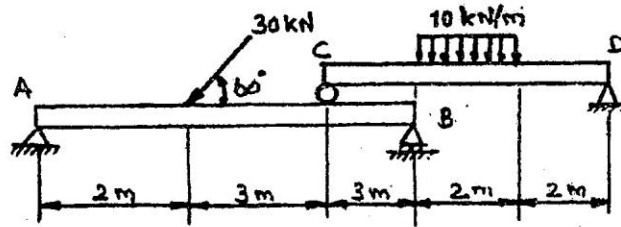


Figure- 3

(OR)

14. Find the magnitude and position of the resultant of the system of forces shown in figure-4. (8)

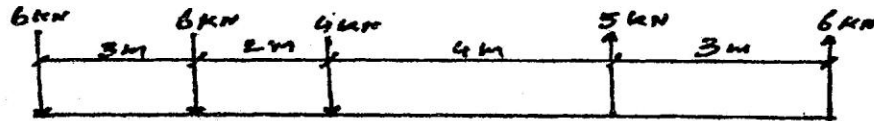


Figure-4.

UNIT - III

15. Calculate the centroid of the shaded area shown in figure-5. (8)

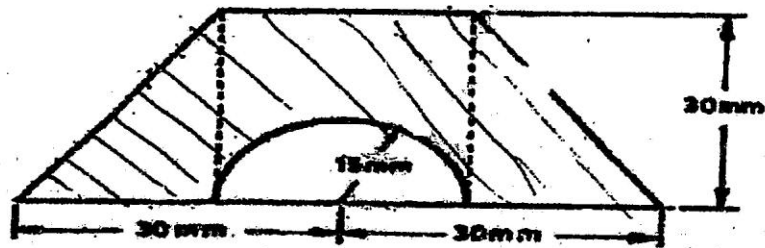


Figure-5.

(OR)

Turn Over

16. Derive an expression for mass moment of inertia of prism along three axis. (8)

UNIT - IV

17. Direct stresses of 120 N/mm^2 tensile and 90 N/mm^2 compression exist on two perpendicular planes at a certain point in a body. They are also accompanied by shear stress on the planes. The greatest principal stress at the point due to these is 150 N/mm^2 . Calculate the magnitude of shear stress on the two planes. (8)

(OR)

18. For a given material, the Young's modulus is $1.1 \times 10^5 \text{ N/mm}^2$ and the 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 40 mm diameter and 25 mm length when stretched by 2.5 mm. (8)

UNIT - V

19. What load will be lifted by an effort of 120 N, if the velocity ratio is 18 and the efficiency of the machine at this load is 60 percent? If the machine has a constant frictional resistance, determine the law of the machine and find the effort required to run the machine at

(a) no load

(b) load of 90 N.

(8)

(OR)

20. In a simple screw jack, the pitch of the screw is 10 mm and length of the handle is 450 mm. Find the velocity ratio. If an effort of 25 N applied at the end of the handle can lift a load of 3000 N, find the efficiency of the jack. Also, calculate the amount of effort wasted in friction and the frictional load. (8)

Register Number :

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0 1 0 6

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

106. BASIC ENGINEERING

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

May]

[Time : 3 Hours

Maximum : 60 Marks

Section - A - Answer ALL questions.

Section - B Answer any TWO FULL questions.

ALL questions carry EQUAL marks.

PART - A

(20)

(CIVIL ENGINEERING)

SECTION - I

1. Name the duties of a civil engineer. (4)
2. Differentiate bearings from angles. (3)
3. What are the different types of earth dams? (3)

SECTION - II

4. Explain the kinds of traffic signs. (5)
5. Write a note on slow sand filter and explain with a neat sketch. (5)
6. Draw a line diagram for king post truss and explain. (5)
7. How bridges are classified according to the location and function? (5)

Turn Over

PART - B

(20)

*(MECHANICAL ENGINEERING)***SECTION - I**

(3 × 2 = 6)

Answer ALL questions.

1. Write the applications of boilers.
2. Mention the advantages and disadvantages of arc welding.
3. Define gear train.

SECTION - II

(2 × 7 = 14)

Answer any TWO FULL questions.

4. Explain with neat sketch, the working principle of locomotive boiler. (7)
5. Explain working principle of four stroke diesel engine with neat sketch. (7)
6. Explain the rolling process with neat sketch. (7)

PART - C

(20)

*(ELECTRICAL ENGINEERING)***SECTION - I**

(3 × 2 = 6)

Answer ALL questions.

1. Define energy.
2. What is the difference between motor and generator?
3. Define rectifier.

SECTION - II

 $(2 \times 7 = 14)$

Answer any TWO FULL questions.

4. Find the current in each branch of given network in given circuit using loop analysis.
(Figure - 1).

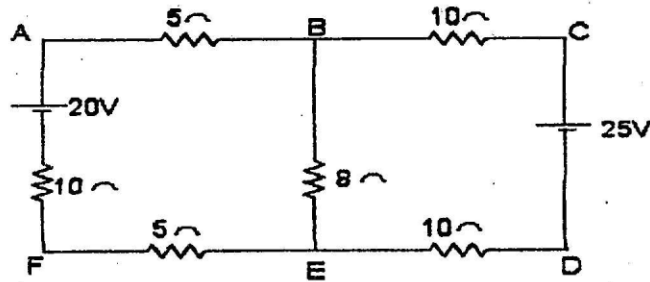


Figure- 1.

5. Explain the working of DC generator with neat diagram.
6. With neat diagram, explain the principle of Radio communication.

Register Number:

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0107

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL)

(FIRST YEAR)

107. ENVIRONMENTAL STUDIES

(New Pattern)

May]

[Time : 3 Hours

Maximum : 60 Marks

SECTION-A

Answer ALL questions

(10 × 2= 20)

1. Name the different types of energy resources.
2. What are the various processes by which mineral deposits are formed?
3. Define food chain and food web.
4. Define ecological succession.
5. What are the types of grassland ecosystem?
6. Give the importance of biodiversity.
7. What do you mean by DO & BOD?
8. Explain thermal pollution.
9. What is ozone layer depletion?
10. What are the advantages of rain water harvesting?

SECTION-B

Answer ONE FULL question from each unit

(5 × 8= 40)

UNIT-I

1. Briefly discuss droughts and floods with respect to their occurrences and impacts.
2. Explain the role of an individual in conservation of natural resources.

UNIT-II

3. a) What are biochemical cycles?
b) Explain carbon cycle and nitrogen cycle.
4. Describe the structure and function of forest ecosystem.

UNIT-III

5. Write notes on values of biodiversity and hotspots of biodiversity.
6. Explain In-situ and Ex-situ conservation of biodiversity.

UNIT-IV

7. Discuss the causes and effects of water pollution.
8. Discuss solid waste management in detail.

UNIT-V

9. Discuss the modern techniques of rain water harvesting.
 10. Discuss the problems associated with resettlement and rehabilitation of people with a case study.
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0 1 0 8

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL)

(FIRST YEAR)

101. TECHNICAL ENGLISH

(Revised Pattern)

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum : 60 Marks for those who joined 2007-08 only)

Answer any ONE FULL question from each unit

ALL questions carry EQUAL marks.

UNIT - I

1. Define non-verbal communication and explain various features of it. (15)

(OR)

2. Explain various barriers to communication. (15)

UNIT - II

3. What are the channels of communication ? (15)

(OR)

4. Write a short note on the following : (3 × 5 = 15)

(a) Skimming and scanning.

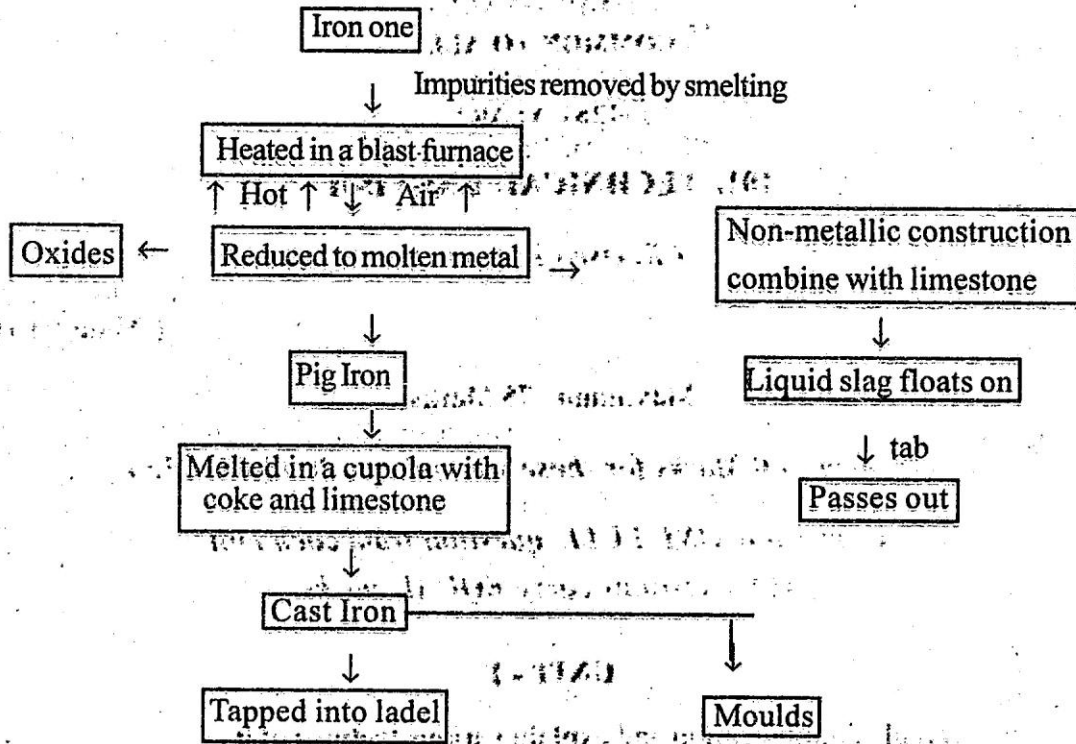
(b) Effective listening strategies.

(c) English speech sounds.

Turn Over

UNIT - III

5. Convert the following flow chart into a running passage of 300 words, and also give suitable title. (15)



(OR)

6. Write an essay on social Networking sites. Also, discuss its advantages and disadvantages.

(15)

UNIT - IV

7. Write a letter of job application for the post of Executive Engineer to the HR Manager of Sri. MS. Constructions Ltd., Vadapalani, Chennai-26. Give a separate resume along with your letter. (15)

(OR)

8. Imagine that you are the Marketing Executive of Good Night Ltd. (chennai branch). Study the facility of introducing a new herbal mosquito repellent and submit the report to your Managing Director. (15)

UNIT - V

9. (a) Match words :

Fog	Penetrating
Mutilate	Loss of hope
Piercing	Mist
Despair	Damage a necessary part.

(2)

(b) Fill-in the blanks with appropriate tense forms :

(i) Ravi _____ (get) up to 4-30 in the morning.

(ii) That stone _____ (lie) there for weeks.

(iii) They _____ (lay) the road by next week.

(iv) She _____ (work) throughout the day.

(4)

(c) Use any TWO of the following phrasal verbs in sentence of your own :

(i) Sort out

(ii) Let down

(iii) Wear out

(2)

(d) Rewrite as directed :

1. Teachers always advise the students to prepare well for the examination.

(into other voice)

2. Steps are being taken by the Government to erradicate illiteracy in our country.

(into other voice)

3. There are lot of trees at the end of this road.

(question tag)

4. She sings sweetly.

(question tag) (4)

(e) Expand the following :

ICBM

NCERT

PSLV

(3)

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0 1 0 9

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

102. ENGINEERING MATHEMATICS - I

(Revised Regulations)

(For those who joined between 2011-12 and after)

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for those who joined before 2011-12)

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 $A = \begin{bmatrix} 2 & -3 & 1 \\ 3 & 1 & 3 \\ -5 & 2 & -4 \end{bmatrix}$. (7)
- (b) Find the co-ordinates of the centre of curvature at any point of the parabola $y^2 = 4ax$. Hence, show that evolute is $27ay^2 = 4(x - 2a)^3$. (8)

(OR)

2. (a) Using Cayley-Hamilton theorem, find A^{-1} and A^4 given $A = \begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$. (8)

Turn Over

- (b) Find the points on the surface $z^2 = xy + 1$ at the least distance from the origin. (7)

UNIT - II

3. (a) Solve : $[(2x - 1)^2 D^2 - 4(2x - 1)D + 8] y = 8x$. (8)

- (b) The deflection y at a distance x along a strut of length l subjected to a number of

loads is given by $EI \frac{d^2 y}{dx^2} + py = -\frac{Wx}{2}$, where E, I, P and W are constants. Given

that for $x = 0, y = 0$ and $x = \frac{l}{2}, \frac{dy}{dx} = 0$. Find the deflection y for

$$x = \frac{l}{2}. \quad (7)$$

(OR)

4. (a) Solve $\frac{d^2 y}{dx^2} - 2 \frac{dy}{dx} + y = e^x \log x$ by the method of variation of parameters. (8)

- (b) In an L-C-R circuit, the charge q on a plate of a condenser is given by

$$L \frac{d^2 q}{dt^2} + R \frac{dq}{dt} + \frac{q}{c} = E \sin pt. \text{ The circuit is turned to resonance so that } p^2 = \frac{1}{LC}$$

.Initially the current $i = 0$ and the charge $q = 0$; determine the current i in the

circuit at the time t for small values of $\frac{R}{L}$. (7)

UNIT - III

5. (a) Change the order of integration in

$$\text{and hence, evaluate } \int_0^1 \int_y^{2-y} xy \, dx \, dy \quad (8)$$

- (b) Using divergence theorem, evaluate $\iiint_S \vec{F} \cdot \hat{n} \, ds$, where $\vec{F} = y\hat{i} + x\hat{j} + z^2\hat{k}$,
 S is the cylindrical region given by $x^2 + y^2 = a^2$, $z = 0$ and $z = h$. (7)
- (OR)

6. (a) Evaluate : $\int_0^1 \int_0^{1-x} \int_0^{x+y} e^z \, dz \, dy \, dx$. (5)

- (b) Verify Stoke's theorem for $\vec{F} = (x^2 - y^2)\hat{i} + xy\hat{j}$ in the rectangular region in the XOY plane bounded by the sides $x = 0$, $x = a$, $y = 0$ and $y = b$. (10)

UNIT - IV

7. (a) Find an analytical function $w = f(z) = u + iv$,

given $u = e^{-x} [(x^2 - y^2) \cos y + 2xy \sin y]$.

Also, find v .

- (b) Using residue theorem, evaluate (7)

$$\int_c \frac{z^3}{(z-1)^4(z-2)(z-3)} \, dz$$

where c is $|z| = 3$.

(OR)

8. (a) Determine the region of the w -plane into which the region bounded by $x = 1$, $y = 1$ and $x + y = 1$ is mapped by the transformation $w = z^2$. (8)

(b) Evaluate : $\int_0^{2\pi} \frac{1}{13 + 5 \sin \theta} \, d\theta$, using contour integration. (7)

Turn Over

UNIT - V

9. (a) Find the Laplace transform of $\frac{\sin^2 t}{t}$. (5)

(b) Find the Laplace transform of the function $f(t) = \begin{cases} E, & 0 < t < \frac{a}{2} \\ -E, & \frac{a}{2} < t < a. \end{cases}$

and $f(t+a) = f(t)$. (6)

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

(OR)

10. (a) Find the inverse Laplace transform of

$$\frac{s}{(s^2 + 4)(s^2 + 9)}$$

(6)

by using convolution theorem.

(b) Solve : $(D^2 - 3D + 2)y = 1 - e^{2t}$, (9)

given $y = 1, Dy = 0$ when $t = 0$.

Register Number :

Name of the Candidate :

0 1 1 0

B.E. DEGREE EXAMINATION, 2014

(FIRST YEAR)

103. ENGINEERING PHYSICS

(Revised Pattern)

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum : 60 marks for those who joined 2007-08 only)

Answer ALL questions.

ALL questions carry EQUAL marks.

UNIT - I

1. (a) Explain how you will determine the co-efficient of viscosity of a liquid by Stokes method. (8)

(b) Distinguish between streamline and turbulence. (7)

(OR)

2. (a) Write an essay about the acoustics of buildings and the factors affecting it. (8)

(b) Explain how are the ultrasonic wave produced using amagnetostriction method. (7)

UNIT - II

3. (a) Explain the construction and working of He-Ne laser. (8)

(b) Derive an expression for acceptance angle in optical fibers. (7)

(OR)

4. (a) Describe a method of finding the thickness of a wire using air wedge. (8)

(b) Distinguish between isoclinic and isochromatic fringes. (7)

Turn Over

UNIT - III

5. (a) What is packing factor ? Calculate the packing fraction HCP. (8)
(b) What are Miller indices ? How will you determine the Miller indices of a given plane ? (7)

(OR)

6. (a) Explain the construction and working of Bragg spectrometer. (8)
(b) Write a short note on Frenkel defect. (7)

UNIT - IV

7. (a) Derive the Widemann Franz's law. (8)
(b) Write a short note on BCS theory. (7)

(OR)

8. (a) What is Hall effect ? Explain the experimental technique used to find Hall co-efficient. (8)
(b) Describe the properties and application of metallic glasses. (7)

UNIT - V

9. (a) Obtain an expression for particle in one dimensional box. (8)
(b) Mention the physical significance of wave function. (7)

(OR)

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

Register Number :

Name of the Candidate :

0 1 1 1

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

104. ENGINEERING CHEMISTRY

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 marks for those who joined 2007-08 only)

Answer any ONE FULL question from each unit

ALL questions carry EQUAL marks.

UNIT - I

1. (a) Explain the ion-exchange process. (7)
 - (b) Define COD. Explain the determination of COD in sewage water. (8)
- (OR)
2. (a) Discuss the determination of total hardness by EDTA method. (7)
 - (b) Explain the causes and effects of greenhouse effect and acid rain. (8)

UNIT - II

3. (a) Derive Freundlich adsorption isotherm. (7)
 - (b) Give the preparation, properties and uses of polyester resins and silicone resins. (4)
- (OR)
4. (a) Explain the factors influencing adsorption of gases on solids. (7)
 - (b) Compare thermoplastic and thermosetting plastic. (8)

Turn Over

UNIT - III

5. (a) Discuss the proximate analysis of coal. (7)
(b) Give an account of knocking, octane and cetane number. (8)

(OR)

6. (a) Describe bergive process of manufacture of synthetic petrol. (7)
(b) Explain the construction and working of solar cells. (8)

UNIT - IV

7. (a) Explain the construction and working of Nickel-Cadmium cell. (7)
(b) Discuss the mechanism of electro chemical corrosion. (8)

(OR)

8. (a) What are the factors influencing on rate of corrosion ? (7)
(b) Explain the following : (8)
(i) Tinning (ii) Galvanizing.

UNIT - V

9. (a) Give the preparation, properties and uses of abrasives. (7)
(b) Write short notes on preparation of calbon nano tube. (8)

(OR)

10. (a) Discuss the properties of refractories. (7)
(b) Give an account of nano compositer. (8)

Register Number :

Name of the Candidate :

0 1 1 2

B.E. DEGREE EXAMINATION, 2014

(ANNUAL PATTERN)

(FIRST YEAR)

105. ENGINEERING MECHANICS

(Revised Regulations)

(For those who joined during 2011-12 and after)

May]

[Time : 3 Hours

Maximum : 75 Marks

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

Answer any ONE FULL question from each unit.

Assume suitable data wherever necessary.

EACH question carries FIFTEEN marks.

UNIT - I

1. (a) Distinguish between scalar and vector quantities. (10)
- (b) Forces R, S, T, U are collinear. Forces R and T act from left to right. Forces S and U act from right to left. Magnitudes of the forces R, S, T, U are 40N, 45N, 50N, 55N respectively. Find the resultant of R,S, T,U. (5)

(OR)

2. A force P is applied at 'O' to the string AOB as shown in figure-1. If the tension in each part of the string is 50 N, find the direction and magnitude of force P for equilibrium conditions. (15)

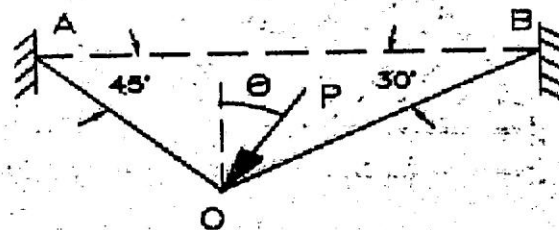


Figure-1.

Turn Over

UNIT - II

3. Two beams AB and CD are shown in figure-2. A and D are hinged supports. B and C are roller supports. Sketch the free body diagram of the AB and determine the reactions at the supports A and B. (15)

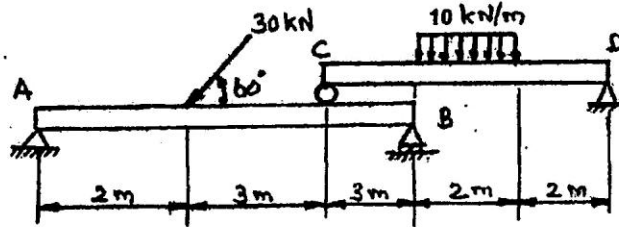


Figure-2.

(OR)

4. Four forces act on a square of side 1 m as shown in figure-3. Reduce the force system into an equivalent force-coupled system in A. (15)

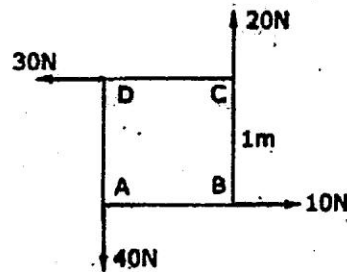


Figure-3

UNIT - III

5. Calculate the centroid of the shaded area shown in figure-4. (15)

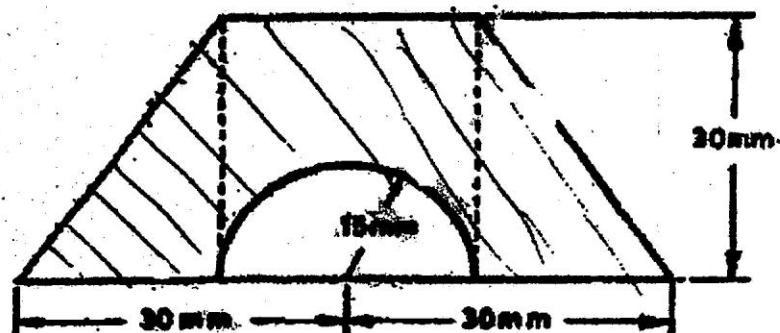


Figure-4

(OR)

6. Derive an expression for finding out the radius of gyration of a symmetrical I-section. (15)

UNIT - IV

7. Direct stresses of 120 N/mm^2 tensile and 90 N/mm^2 compression exist on two perpendicular planes at a certain point in a body. They are also accompanied by shear stress on the planes. The greatest principal stress at the point due to these is 150 N/mm^2 . Calculate the magnitude of shear stress on the two planes. (15)

(OR)

8. A reinforced concrete column is $30 \text{ cm} \times 30 \text{ cm}$ 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 $E_s = 2.1 \times 10^5 \text{ N/mm}^2$, $E_c = 0.14 \times 10^5 \text{ N/mm}^2$. (15)

UNIT - V

9. (a) Differentiate velocity ratio and mechanical advantage. (5)
- (b) An effort of 20 N is applied to a machine to lift a load of 900 N. The distance moved by the effort is 2.40 m and by the load the distance moved is 4 cm. Determine :
- (i) Mechanical advantage.
- (ii) Velocity ratio of the machine. (10)
10. Explain the following with neat sketches :
- (a) Simple wheel and axle.
- (b) Simple screw jack.
- (c) Worm and wheel. (5)

Register Number :

Name of the Candidate :

0 1 1 3

B.E. DEGREE EXAMINATION, 2014

(FIRST YEAR)

(COMMON TO ALL BRANCHES)

106. BASIC ENGINEERING

(For the Candidates of 2011-12 batch and later)

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 marks for those who joined before 2007-08 only)

PART - A

(25)

(CIVIL ENGINEERING)

Answer any ONE FULL question from each unit

ALL questions carry EQUAL marks.

UNIT - I

1. (a) Name the various specialisations in Civil Engineering and explain them. (9)
- (b) Name the different types of floorings. (4)

(OR)

2. (a) Write the objectives of foundation. (4)
- (b) Describe the different instruments used in chain surveying. (9)

UNIT - II

3. (a) Name the purposes of dams and explain gravity dam. (8)
- (b) Write briefly about septic tank. (4)

(OR)

4. (a) Describe the different classifications of bridges. (8)
- (b) Write the different methods of sewage treatment. (4)

Turn Over

PART - B

(25)

(MECHANICAL ENGINEERING)

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

UNIT - I

5. (a) Differentiate clearly between open and closed cycle gas turbine. (5)
(b) Draw and explain Wilcox boiler. (8)

(OR)

6. (a) Write down the differences between impulse and reaction turbines. (5)
(b) With neat sketch, explain the parts of an I.C. engine. (8)

UNIT - II

7. (a) What are the different types of flames ? How are they formed ? (5)
(b) List the various arc welding process. Explain the electric arc welding. (7)

(OR)

8. (a) Compare Cold working with Hot working. (5)
(b) Write notes on : (7)

(i) Roller chain. (ii) Block chain. (iii) Silent chain.

PART - C

(25)

(ELECTRICAL ENGINEERING)

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

UNIT - I

9. A load of 20 kW operates at 0.8 power factor lag when connected to a 400 volts, 50 Hz cycle source. Find
(a) The current in the load. (b) The power factor angle.
(c) The impedance. (d) The resistance
and (e) The reactance of the load. (13)

(OR)

10. Describe the construction and working of induction type energy meter with neat diagram. (13)

UNIT - II

11. Explain the working of UJT with circuit diagram and its characteristics. (12)

(OR)

12. Draw the block diagram of a Computer System and explain working of each unit. (12)

Register Number :

Name of the Candidate :

0 1 1 4

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

107. ENVIRONMENTAL STUDIES

(Revised Pattern)

(For the students joined during 2011-12 and after)

May]

[Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 marks for those who joined before 2011-12)

Answer any ONE FULL question from each unit

ALL questions carry equal marks.

UNIT - I

1. What is renewable and non-renewable source of energy? Explain with example. (15)

(OR)

2. Briefly discuss droughts and floods with respect to their occurrences and impacts. (15)

UNIT - II

3. Write short notes on i) Ecosystem features.

ii) Functional attributes. (15)

(OR)

4. What are the classifications of biotic components of ecosystem? (15)

UNIT - III

5. Write in detail about *in situ* and *ex situ* conservation of biodiversity. (15)

(OR)

Turn Over

6. (a) What are the major threats to biodiversity? (5)
(b) Explain different values of Biodiversity. (10)

UNIT - IV

7. (a) Explain the causes, effects and control of soil pollution. (8)
(b) How can you prevent pollution of our oceans? (7)

(OR)

8. (a) Write the sources of biomedical wastes and its treatment. (7)
(b) How adverse effects can solid waste cause? (8)

UNIT - V

9. Why do we refer to Environmental Protection Act, 1986 as an Umbrella Act? Discuss the major environmental protection rules, 1986. (15)

(OR)

10. (a) Discuss in details on various health scheme initiated by Indian Government. (7)
(b) Discuss the symptoms and treatment of HIV / AIDS. (8)