

Register Number :

Name of the Candidate :

3 0 0 8

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

101. TECHNICAL ENGLISH

(For the candidates of 2011-12 batch 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. Explain the various cues in non-verbal communication.

(OR)

2. Write on the following :

- (a) Effective listening. (b) Barriers to listening.
(c) Tips to overcome barriers of listening.

UNIT - II

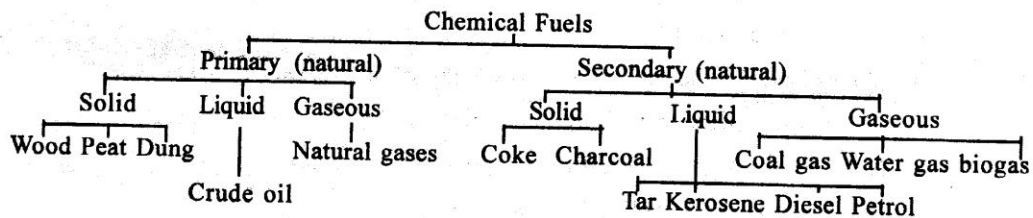
3. Explain the importance of pronunciation and also, suggest ways to have good pronunciation.

(OR)

4. Write an essay on consonants and plosives.

UNIT - III

5. Convert the following flow chart into a running passage of 300 words :



(OR)

6. The ultimate aim of all advertising is to sell all commodity but in order to achieve this, there are a few obstacles which the adman has to overcome. First of all, prospective buyers are likely to be reading the newspaper or magazine not because of its advertising material but because of its editorial material; moreover, roundabout half of the publication is likely to consist of adverts, all of them competing for the readers attention. The first task of the adman then is to make sure that his advert is noticed. Once the reader's attention has been caught, the advert should also hold his attention and it should convince him that the subject of this particular advert is of interest to him. Furthermore, the advert has to convince the reader that the commodity will satisfy some need or create a need which he has not felt before. Finally, it is not enough that the prospective customer should come to feel a need for the product in general; the advert must convince him that the particular brand advertised has some qualities which will make it superior to other similar brands. In addition, the ideal advert should be constructed in such a way that as much as possible of its message will get across even to the reader who merely notices it but decides not to read it.

UNIT - IV

7. A leading software company looks for freshers for the post of Junior Engineer. Apply with your job application letter and resume.

(OR)

8. Write a report to your Managing Director about the mismanagement happening in one of the branches of KS brands. As a Human Resource manager, give your suggestions and recommendations.

UNIT - V

9. (a) (i) *Match words :* (2)
- | | |
|-------------------|---------------------------------------|
| (A) Enterprise | (I) Ability to attempt something new. |
| (B) Obsolescence | (II) Division of atom. |
| (C) Fission. | (III) Pollution. |
| (D) Contamination | (IV) Out of date. |
- (ii) *Rewrite as directed :* (4)
- (A) Beautifully the author has written the book. (*Change to other voice.*)
- (B) She was made to wait by the guide. (*Change to other voice.*)
- (C) I need not go to the office today. (*Add a question tag.*)
- (D) She sings very well. (*Add a question tag.*)

- (iii) *Fill-in the blanks with appropriate tense :* (2)
"Doctor"! My friend _____ (bite) by a snake. I _____ (not, see) the snake.
I only _____ (hope) it _____ (be) not a poisonous one.
- (iv) *Frame a sentence of your own using the given phrasal verbs :* (2 × 1 = 2)
(A) Put-up. (B) Sort out.
- (v) *Correct the following sentences :*
(A) The company was in India since 1951.
(B) My apartment is on tenth floor.
- (vi) *Expand the following :*
(A) NCERT.
(B) TANSI.
(C) FICCI.

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B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

102. ENGINEERING MATHEMATICS - I

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks

UNIT - I

1. (a) Diagonalise the matrix $A = \begin{bmatrix} 3 & 1 & 1 \\ 1 & 3 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ by means of orthogonal transformation.

Interpret the result in terms of quadratic forms. (8)

- (b) Find the evolute of the curve $x = ct, y = \frac{c}{t}$. (7)

(OR)

2. (a) Verify that the matrix $A = \begin{bmatrix} 2 & -1 & 2 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ satisfies the characteristic equation and hence,

find A^4 . (7)

- (b) Find the radius of curvature for $xy^2 = a^2 - x^3$ at $(a, 0)$. (78)

UNIT - II

3. (a) Solve : $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = e^x \cos x + x^2 + 3$. (8)

- (b) An electromotive force $E \sin pt$ is applied at $t = 0$ to a circuit containing a capacitance C and inductance L . The charge q is given by $L \frac{d^2q}{dt^2} + \frac{q}{C} = E \sin pt$. If $p^2 = \frac{1}{LC}$ and initially the current and charge are zero, find the current i at time t . (7)

(OR)

4. (a) Solve : $\frac{dx}{dt} + 4x + 3y = t$; $\frac{dy}{dt} + 2x + 5y = e^t$. (8)

- (b) In case of stability of rods, the equation satisfied by the deflection is

$EI \frac{d^2y}{dx^2} + Py = C - Rx$ where E, I, C, P, R are constants. If $y = 0$ and $\frac{dy}{dx} = 0$ when $x = 0$ and $x = l$. Show that $\tan(nl) = nl$, where $EIn^2 = P$ and $C = RI$. (7)

UNIT - III

5. (a) Evaluate : $\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y} dy dx$ by changing the order of integration. (7)

- (b) Find the values of the constants a, b, c so that

$$\vec{F} = (axy + bz^3)\hat{i} + (3x^2 + cz)\hat{j} + (3xz^2 - y)\hat{k}$$

may be irrotational. For those values of a, b, c find also, the scalar potential function ϕ of \vec{F} . (8)

(OR)

6. (a) Evaluate : $\int_0^{\infty} \int_x^{\infty} \int_0^{\infty} \frac{(x+y)^2}{x} x dz dy dx$. (5)

- (b) Verify divergence theorem for $\vec{F} = 4x\hat{i} - 2y^2\hat{j} + z^2\hat{k}$ taken over the region bounded by $x^2 + y^2 = 4, z = 0$ and $z = 3$. (10)

UNIT - IV

7. (a) Construct the analytic function $u + iv$, given that $2u + v = e^x (\cos y - \sin y)$. (7)

- (b) Obtain the Laurent's expansion for $\frac{(z-2)(z+2)}{(z+1)(z+4)}$ which are valid in

(i) $1 < |z| < 4$. and (ii) $|z| > 4$. (8)

(OR)

8. (a) Find the image of the circle $|z - 1| = 1$ under the mapping $w = \frac{1}{z}$ (6)

(b) Evaluate : $\int_{-\infty}^{\infty} \frac{x^2 - x + 2}{x^4 + 10x^2 + 9} dx$ using contour integration. (9)

UNIT - V

9. (a) Find the Laplace transform of $\left[t \left(\int_0^t \frac{\sin u}{u} du \right) \right]$. (5)

(b) Find : $L^{-1} \left[\frac{s-1}{(s+3)(s^2+2s+2)} \right]$. (5)

(c) Verify the initial and final value theorem for the given function $f(t) = 1 + z^{e-2t}$. (5)

(OR)

10. (a) Find the Laplace transform of the periodic function :

$$\begin{aligned} f(t) &= \sin t, & 0 < t < \pi \\ &= 0, & \pi < t < 2\pi \end{aligned}$$

and $f(t + 2\pi) = f(t)$. (6)

(b) Solve by Laplace transform : $\frac{d^2 y}{dt^2} + 2 \frac{dy}{dt} + 5y = e^{-t} \sin t$

given $y(0) = 0$, $\frac{dy}{dt}(0) = 1$ (9)

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B.E. DEGREE EXAMINATION, 2014

(FIRST YEAR)

103. ENGINEERING PHYSICS

(For the candidates of 2011-12 batch 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) Explain how you will determine the co-efficient of viscosity of a liquid by Stroke's method. (8)
- (b) Explain theory of Torsional Pendulum. (7)

(OR)

2. (a) Explain with neat sketch, the construction and production of ultrasonic waves using piezoelectric oscillator. (8)
- (b) Derive an expression for reverberation time. (7)

UNIT – II

3. (a) Explain construction and working of Nd : YAG. (8)
- (b) Derive an expression for numerical aperture and angle of acceptance of a fibre in terms of refractive indices of a core and cladding. (7)

(OR)

4. (a) Explain the theory of air wedge. (8)
- (b) Distinguish between isoclinic and isothermal fringes. (7)

UNIT – III

5. (a) Define the term atomic radius and packing factor. Calculate the above for BCC and FCC structure. (8)
- (b) Write a short note on F and E colour centres. (7)

(OR)

6. (a) Explain the production and characteristics of X-rays Bragg's laws. (8)
(b) What are Miller Indices and explain the procedure for finding Miller indices. (7)

UNIT - IV

7. (a) Derive an expression for internal fields and deduce Clausius acoustic relation. (8)
(b) Explain shape memory alloys. (7)

(OR)

8. (a) What is Hall effect? Explain experimental technique used to find Hall co-efficient. (8)
(b) Write short notes on high temperature superconductivity. (7)

UNIT - V

9. (a) Derive an expression for Particle in a one-dimensional box. (8)
(b) Explain uncertainty principle with an illustration. (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)

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3011

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

104. ENGINEERING CHEMISTRY

(For the candidates of 2011-12 batch 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) Discuss the various methods of internal treatment of boiler feedwater. (7)
- (b) What are the causes and significance of BOD? (8)
- (OR)
2. (a) Explain the process of reverse osmosis. (7)
- (b) Write short notes on acid rain and green house effect. (8)

UNIT - II

3. (a) Derive Langmuir adsorption isotherm. (7)
- (b) Give the preparation, properties and uses of Nylon-6,6, Vinyl resins. (8)
- (OR)
4. (a) Explain the factors influencing adsorption of gases on solids. (7)
- (b) Compare thermoplastic and thermosetting plastics. (8)

UNIT - III

5. (a) Discuss the proximate analysis of coal. (7)
- (b) Explain the flue gas analysis using orsat apparatus. (8)
- (OR)
6. (a) Describe the method 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 Lead-acid storage battery. (7)
(b) Explain factors influencing on rate of corrosion. (8)
- (OR)
8. (a) Discuss the mechanism of wet corrosion. (7)
(b) Write short notes on anodizing and phosphating metal coatings. (8)

UNIT – V

9. (a) Discuss the properties (*any five*) of refractories. (7)
(b) Write short notes on preparation of carbon nano tubes. (8)
- (OR)
10. (a) Give the preparation, properties and uses of abrasives. (7)
(b) Give the account of Fullerenes and semiconductor sensors. (8)

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B.E. DEGREE EXAMINATION, 2014

(ANNUAL PATTERN)

(FIRST YEAR)

105. ENGINEERING MECHANICS

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

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

Assume suitable data wherever necessary.

ALL questions carry EQUAL marks.

UNIT - I

1. (a) State and explain Lami's theorem of triangle law of equilibrium. (5)
(b) The resultant of two concurrent forces is 1500 N and the angle between the forces is 90° . The resultant makes an angle of 36° with one of the force. Find the magnitude of each force. (10)

(OR)

2. A force vector of magnitude 900 N starts at the point $(-4, 2, 1)$ and terminates at the point $(1, -3, 6)$. Find the moment of the forces about x, y, z axes. (15)

UNIT - II

3. A beam AB 6 m long is loaded as shown in figure-1. Determine the reactions at A and B by analytical method.

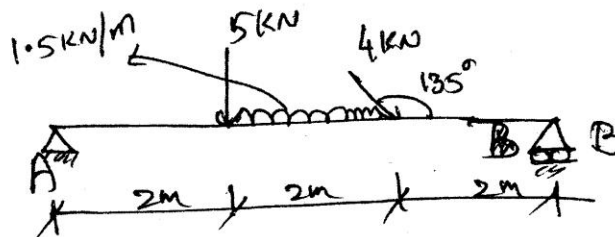


Figure -1

(OR)

4. The bar AC, 10 m long supports a load of 6000 N at shown in figure-2. The cable BC is horizontal and 5 m long. Determine the forces in the cable and the bar. (15)

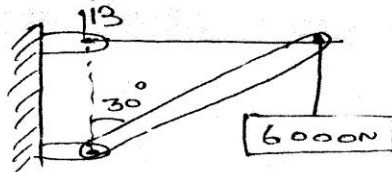


Figure-2

UNIT - III

5. Calculate the moment of inertia and radius of gyration about the X- axis for the sectioned area as shown in figure- 3.

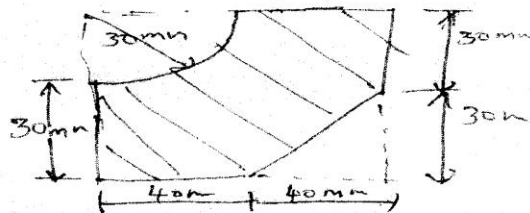


Figure-3

(OR)

6. Determine the second moment of area of the section shown in figure-4 about its base axis a-a. (15)

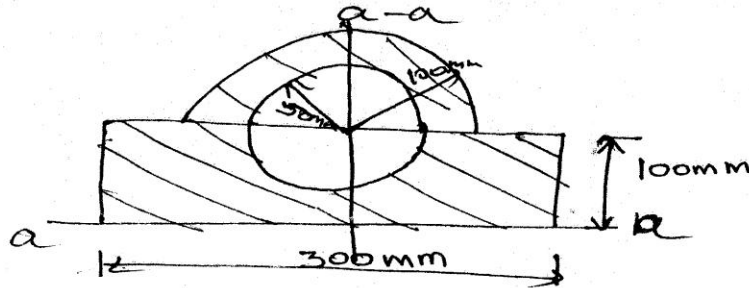


Figure-4.

UNIT- IV

7. Determine the Poisson's ratio and bulk modulus of a material, for which Young's modulus is $1.2 \times 10^5 \text{ N/mm}^2$. Modulus of rigidity is $4.8 \times 10^4 \text{ N/mm}^2$. (15)

(OR)

8. The tensile stresses at a point across two mutually perpendicular planes are 130 N/mm^2 and 70 N/mm^2 . Determine the normal, tangential and resultant stresses on a plane inclined at 30° to the axis of the minor stress. (15)

UNIT - V

9. Explain the following with neat sketches :

- (a) Simple screw jack. (b) Simple wheel and axle.
(c) Handle winch.

(5 + 5 + 5)

(OR)

10. A screw jack is used to lift a load of 3 kN. The screw of the screw-jack is square threaded with two threads to 1.2 cm. If the co-efficient of friction between the nut and screw is 0.08 and the outer diameter of the screw is 6 cm, determine the force required at the end of the handle of length 60 cm to lift the load. (15)

Register Number :

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3013

B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

106. BASIC ENGINEERING

November]

[Time : 3 Hours

Maximum : 75 Marks

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

ALL questions carry EQUAL marks.

PART - A

(CIVIL ENGINEERING)

(25)

Answer ONE FULL question from each unit.

UNIT - I

1. (a) Write the qualities of good building stones. (8)
- (b) Describe the types of flooring. (5)

(OR)

2. The following perpendicular offsets were taken at 10 metre intervals from a survey line to an irregular boundary line : 3.60, 2.80, 4.50, 8.25, 7.85, 6.45, 5.35. Calculate the area enclosed between the survey line and the boundary line by Simpson's rule. (13)

UNIT - II

3. (a) List the different classifications of roads and explain any one. (4)
- (b) Draw a sketch showing the railway track for single line and explain. (8)

(OR)

4. (a) Write in detail the different classifications of dams and explain them. (7)
- (b) With a neat sketch, explain a septic tank. (5)

PART - B**(MECHANICAL ENGINEERING)****(25)***Answer ONE FULL question from each unit.***UNIT - I**

5. (a) Compare four stroke and two stroke engine. (5)
 (b) Explain the working principle of Babcock boiler with the help of a neat sketch. (8)

(OR)

6. (a) Draw and explain the working principle of simple carburetor. (5)
 (b) Write the working principle of open and closed cycle gas turbine. (8)

UNIT - II

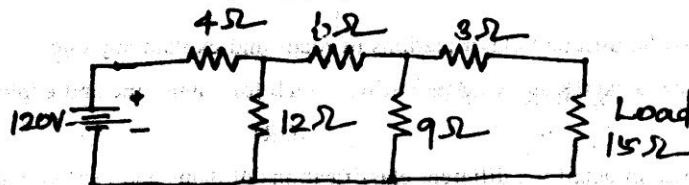
7. (a) What do you understand by forging? What are the advantages of forging? (5)
 (b) Explain the various types of gears. Discuss any two gears with a neat sketch. (7)

(OR)

8. (a) Mention the advantages and disadvantages of belt drives. (7)
 (b) Describe the parts and operation performed by drilling machine. (5)

PART - C**(ELECTRICAL ENGINEERING)****(25)***Answer ONE FULL question from each unit.***UNIT - I**

9. In the circuit shown in figure-1, obtain the load current and the power delivered to the load.

**Figure -1****(OR)**

3

10. With schematic diagram, explain the working of different types of DC motor.

UNIT - II

11. Explain the working of half-wave and full-wave rectifiers with circuit diagrams.

(OR)

12. Explain the working of any two types of flip-flops with symbol and truth-table.

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B.E. DEGREE EXAMINATION, 2014

(COMMON TO ALL BRANCHES)

(FIRST YEAR)

107. ENVIRONMENTAL STUDIES

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

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

Assume suitable data wherever necessary.

ALL questions carry EQUAL marks.

UNIT - I

1. What are the major causes of de-forestation? Explain its consequences. (15)
(OR)
2. (a) Enumerate the uses and exploitation of mineral resources. (7)
(b) Discuss the effects of modern agricultural methods. (8)

UNIT - II

3. Explain :
(a) Grassland ecosystem. (b) Food chain. (c) Food web. (3 × 5 = 15)
(OR)
4. Discuss the process of ecological succession with an example with a neat diagram. (15)

UNIT - III

5. Briefly explain the conservation of bio-diversity. (15)
(OR)
6. (a) Compare :
(i) Extinct and endangered. (ii) Vulnerable and rare species with an example. (8)
(b) Discuss the salient features of hotspots found in India. (7)

UNIT - IV

7. (a) What is thermal pollution? Explain its sources and effects on ecosystem. (8)
(b) Describe in brief nuclear pollution its causes, effects and measures. (7)

(OR)

8. (a) What are the three R's for the management of solid waste? (5)
(b) Explain any one polluted site near your residence by indicating the source of pollution. Also, suggest how the pollution shall be managed. (10)

UNIT - V

9. (a) Explain in detail the strategies adopted for conservation of water. (7)
(b) What are the drawbacks of forest and pollution related Act? (8)

(OR)

10. What is the role of NMIS, ENVIS and GIS in the dissemination of Environmental Information and Environmental Management? (15)