(b) Derive the Schrodinger time dependent wave equation. (7)

(OR)

10. (a) Bring out differences between nuclear fission and nuclear fusion. (7)

(b) Briefly explain construction and working of a nuclear reactor. (8)

2. (a) What are the factors affecting acoustics of a building and their remedies? (7)

(b) Describe magnetostriction method of producing ultrasonic waves. (8)

UNIT – II

3. (a) Explain the construction and working of ruby laser. (7)

(b) Discuss the various types of optical fibres. (8)

(OR)

4. (a) Explain the construction and working of Micheleson's interferometer. (8)

(b) Describe a method of finding the thickness of a wire using air wedge. (7)

UNIT – III

5. (a) Calculate the packing factor of BCC and FCC crystal structures. (8)

(b) Write the properties and uses of X-rays. (7)

(OR)

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B.E. DEGREE EXAMINATION, 2012

(FIRST YEAR)

103. ENGINEERING PHYSICS

(*Revised Pattern*)

November]   [Time : 3 Hours

Maximum : 75 Marks

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

Answer ONE FULL question from eqch unit.

UNIT – I

1. (a) Derive a relation between three modulii of elasticity. (8)

(b) Explain how you will determine the coefficient of viscosity of a liquid by Poiseuille's method. (7)

(OR)

6. (a) What are Miller Indices? What are their significance? How are they determined? (8)

(b) Describe the various defects in crystal structrures. (7)

UNIT – IV

7. (a) Derive an expression for thermal conductivity of electrons in metal. (8)

(b) Derive the Widemann-Franz's law. (7)

(OR)

8. (a) Derive an expression for internal field in a dielectric and hence obtain Clausius-Mossotti relation. (8)

(b) Write properties and applications of nano materials. (7)

UNIT – V

9. (a) Obtain an expression for De-Broglie wavelength. Also enumerate the properties of matter waves. (8)

Turn Over

Register Number :

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B.E. DEGREE EXAMINATION, 2012

(COMMON TO ALL BRANCHES)

(SECOND SEMESTER)

104. ENGINEERING CHEMISTRY

(New Pattern)

(For the students joined between 2008-09 to 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 units of hardness?

2. What is meant by photochemical smog?

Turn Over

3. Define degree of polymerization.

4. Define adsorbent and adsorbate.

5. What is meant by knocking?

6. Write any two applications of solar cells.

7. Define dry corrosion.

8. What are fuel cells?

9. Define the term viscosity index.

10. What are carbon nano tubes?

PART – B   (5 × 8 = 40)

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

UNIT – I

11. (a) What is meant by desalination? How is it carried out by reverse osmosis method?

    (b) Explain causes, sources and effects of air pollution.

(OR)

16. (a) Describe the manufacture of gasoline by Bersius process.

    (b) Explain the causes, mechanism and prevention of knocking of petrol in I.C. engine.

UNIT – IV

17. (a) Describe the construction and working of concentration cell.

    (b) Describe the mechanism of wet corrosion.

(OR)

18. (a) Discuss the galvanization and tinning process.

    (b) Explain the factors influencing on rate of corrosion.

UNIT – V

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

    (b) Discuss the preparation of nano materials.

(OR)

12. (a) Give an account of Internal treatment of boiler feed water.

    (b) Write a note on green house effect and acid rain.

UNIT – II

13. (a) Discuss the preparation and uses of nylon – 6, 6 and silicon resin.

    (b) Explain the adsorption of gases on solids.

(OR)

14. (a) Explain the mechanism of free radical mechanism of addition polymerization.

    (b) Derive an expression for Langmuir's adsorption Isotherm.

UNIT – III

15. (a) How the flue gas analysis is carried out? Explain with neat diagram.

    (b) Discuss the principle and applications of photovolto.

(OR)

Turn Over

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

    (b) Write short notes on nano composites and Fullerenes.

B.E. DEGREE EXAMINATION, 2012

(CIVIL ENGINEERING)

(FIRST SEMESTER)

CLEC-304/PCLEC-104. ENGINEERING GEOLOGY

Nov)

(Time: 3 Hours

Maximum: 75 Marks
Answer any ONE FULL question from each unit
All questions carry equal marks

(5×15=75)

UNIT-I

1. Describe the physical properties of minerals. (15)

2. Write quartz group and varieties of Quartz. (15)

UNIT-II

3. Describe the classification of igneous rocks. (15)

4. Explain Granite and their availability in India. (15)

UNIT-III

5. Describe the parts of faults and their classification. (15)

(OR)

6. Write about joints, causes of joint patterns and classification of joints. (15)

UNIT-IV

7. a) Write in detail about seismograph and seismogram. (10)

   b) Name the seismic zones of India. (5)

(OR)

8. Describe landslide and the causes of landslides. (15)

UNIT-V

9. Write the five hydrogeological properties of rock and explain them. (15)

10. Write about purpose of tunneling and types of tunnels. (15)

****

8. At a certain point in a strained material, the principle stresses are 100 N/m^2 and 40 N/m^2 both tensile. Find the normal, tangential and resultant stresses across a plane through the point at 48° to the major principal plane using Mohr's circle method. (15)

UNIT – V

9. (a) The efficiency of a machine is 70% when an effort of 10 N is required to raise a load of 500 N. Determine the mechanical advantage and velocity ratio of the machine. (7)

(b) Explain simple screw jack with neat sketch. (8)

(OR)

10. (a) Draw neat sketch of a handle winch and explain the forces. (6)

(b) A weight of 460 N is to be raised by means of 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 mechanical advantage, velocity ratio and efficiency of the machine. (9)

UNIT – I

1. (a) Explain parallelogram, triangular and polygon law of forces. (6)

Turn Over

(b) Determine the tension in cables AB and AC necessary to support the 50 kg cylinder shown in figure - 1. (9)

Figure - 1

(OR)

2. Three cables are used to support the 10 kg cylinder shown in figure - 2. Determine the force developed in each cable for equilibrium. (15)
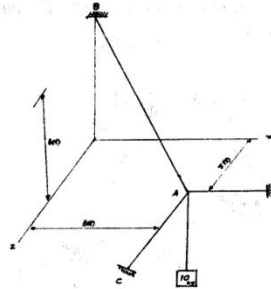

Figure - 2

UNIT – II

3. The 8m pipe AB shown in figure - 3 has a fixed end at A. A steel cable is stretched from B to a point C on the vertical wall. If the tension in the cable is 1200N, determine the moment about A of the force exerted by the cable at B about A. (15)
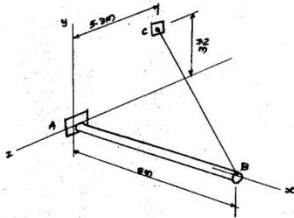

Figure - 3

(OR)

4. (a) Discuss the various types of supports and reactions. (6)

(b) For the frame shown in figure - 4 determine the reactions at A and B. (9)

Figure - 4

UNIT – III

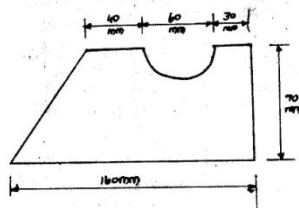5. Determine the moments of inertia about the centroidal axes for the section shown in figure - 5. (15)
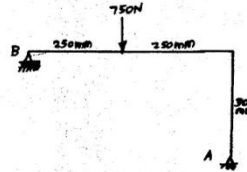

Figure - 5

(OR)

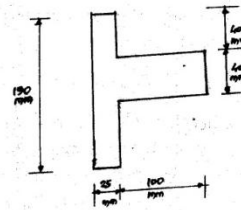6. Determine the polar moment of inertia for section shown in figure - 6. (15)

Figure - 6

UNIT – IV

7. (a) Discuss the various elastic constants and their relationships. (6)

(b) A steel rod 4 m long and 20 mm diameter is subjected to an axial tensile load of 50 kN. Find the change in length, diameter and volume. Take $E_s = 2 \times 10^5$ N/mn^2 and Poissoin's ratio = 0·25. (9)

(OR) **Turn Over**

SECTION – II   (2 × 7 = 14)

Answer any TWO questions.

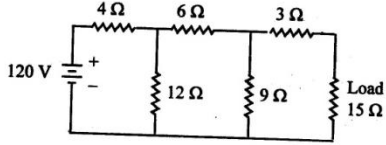4. In the circuit shown (figure - 1), obtain the load current and the power delivered to the load.

Figure - 1

5. Describe the construction and working of Induction type energy meter with neat diagram.

6. Draw the circuit diagram of BJT in common emitter mode and explain the input and output characteristics.

SECTION – II   (2 × 7 = 14)

4. (a) Explain the different types of deep foundation with a neat sketch.   (4)

   (b) State the principles of surveying   (3)

5. Explain the different types of dam with a neat sketch.   (7)

6. Explain the principle and function of septic tank with neat sketch.   (7)

PART – B   (20)

MECHANICAL ENGINEERING

SECTION – I   (3 × 2 = 6)

Answer ALL the questions.

1. Define welding.

2. Distinguish between petrol engines and diesel engines.

3. Write the advantages of belt drives over other drives.

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B.E. DEGREE EXAMINATION, 2012

(COMMON TO ALL BRANCHES)

(FIRST SEMESTER)

106. BASIC ENGINEERING

November]   [Time : 3 Hours

Maximum : 60 Marks

PART-A   20

CIVIL

SECTION – I – Answer ALL questions.
Section – II – Answer any TWO FULL questions.

SECTION – I   (3 × 2 = 6)

1. Define RCC.

2. Define ultimate bearing capacity of soil.

3. Define per capita demand.

Turn Over

SECTION - II   (2 × 7 = 14)

Answer any TWO questions.

4. Explain with neat sketch the working principle of Cochran boiler.   (7)

5. Explain the working principle of four stroke diesel engines.   (7)

6. Draw and explain oxy-acetylene welding.   (7)

PART - C

ELECTRICAL ENGINEERING

SECTION – I   (3 × 2 = 6)

Answer ALL questions.

1. Define current and voltage.

2. What are the sources of electrical energy?

3. Draw the symbol of Thyristor.

4

UNIT - V

19. List the harmful effects created by acid rain on the environment.

(OR)

20. Explain the various methods by which environmental awareness could be instilled on the society.

PART - A   (10 × 2 = 20)

Answer ALL questions.
ALL questions carry EQUAL marks.

1. Name any four ecological serivces rendered by forests.

2. What are the causes that lead to desertification?

3. Define ecosystem.

Turn over

2

4. What is meant by biological magnification in a food chain?

5. Name any two biodiversity hot spots in India.

6. Name any four endangered species in India.

7. What causes fluorosis?

8. Expand BOD and COD.

9. What are the objectives of rain-water harvesting?

10. How can you control acid rain?

PART - B (5 × 8 = 40)

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

UNIT - I

11. Explain the multidisciplinary nature of environmental studies.

(OR)

12. Explain the various causes that lead to deforestation and its impact on the environment.

3

UNIT - II

13. Explain with examples, the major types of food chains.

(OR)

14. Explain the process of ecological succession.

UNIT - III

15. Discuss the causes of man-animal conflicts.

(OR)

16. Explain the significance of India as a mega diversity nation in the world.

UNIT - IV

17. List the various methods by which air pollution can be minimised.

(OR)

18. Draw the flow diagram for treatment of sewage waste water, showing all the steps in its treatment.

10. A horizontal beam ABCD is carried on hinged supports and is continuous over three equal spans each of 3 m. All the supports are initially at the same level. The beam is loaded as shown in figure - 3. Plot the BMD and sketch the deflected shape of the beam if the support A settles by 10 mm, B settles by 30 mm and C settles by 20 mm. The moment of inertia of the whole beam is $2 \cdot 4 \times 10^6$ mm^4 units.

Take $E = 2 \times 10^5$ N/mm^2.   (12)

Figure - 3.

UNIT –I

1. Two wheel loads of 16 kN and 18 kN , at a fixed distance apart of 2 m, cross a beam of 10 m span, Draw the influence line for bending moment and shear force for a point 4 m from the left abutment and find the maximum bending moment and shear force at that point.   (12)
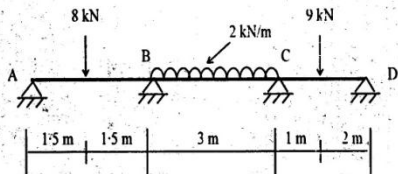
(OR)

Turn Over

2. A UDL of 1 kN/m run, 6m long crosses a girder of 16 m span, Construct the S.F.D and BMD and calculate the values at sections at 3 m, 5 m and 8 m from the left hand support.   (12)

UNIT – II

3. A beam ABC of length 4m rests on three supports equally spaced and is loaded with UDL of 3 kN/m throughout the length of the beam as shown in figure -1. Plot the B.M and S.F diagrams.   (12)
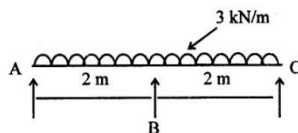

Figure -1.

(OR)

4. A continuous beam ABCD covers three spans AB = 6 m, BC = 12 m and CD = 4 m. It carries uniformly spread loads of 2 kN, 1 kN and 3 kN per metre run on AB, BC and CD respectively. If the beam is of same cross section throughout, find the B.M at the supports B and C and the pressure on each support. Plot the S.F and BM diagrams.   (12)

UNIT - III

5. A three hinged parabolic arch of 20 m span and 4 m central rise carries a point load of 4 kN at 4 m horizontally from the left hand hinge. Calculate the normal thrust and shear force at the section under the load. Also, calculate the maximum positive & negative bending moment.   (12)

(OR)

6. A parabolic arch, hinged at the ends has a span 30 m and rise 5 m. A concentrated load of 12 kN acts at 10 m from the left hinge. The second moment of area varies as the secant of the slope of the rib axis. Calculate the horizontal thrust and the reactions at the hinges. Also,

Turn Over

calculate the maximum bending moment anywhere on the arch. (12)

UNIT - IV

7. A light cable, 18 m long, is supported at two ends at the same level. The supports are 16 m apart. The cable supports three loads of 8, 10 and 12 N dividing the 16m distance in four equal parts. Find the shape of the string and the tension in various portions. (12)

(OR)

8. A suspension cable, stiffened with a three hinged girder, has 100 m span and 10 m dip. The girder carries a load of 0.4 kN/m. A live load of 10 kN rolls from left to right.

Determine

(i) the maximum BM anywhere in the girder.

(ii) the maximum tension in the cable. (12)

UNIT-V

9. A continuous beam ABCD consists of three span and is loaded as shown in figure 2. Ends A and D are fixed. Determine the B.M at the supports and plot the B.M.D. (12)
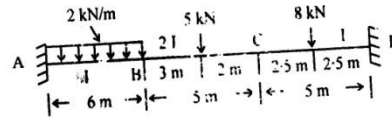

Figure - 2.

(OR)