B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(THIRD SEMESTER)

00HS-301. ENVIRONMENTAL STUDIES

(For the candidates of 2016-17 batch onwards)

(Common to ALL Branches)

November]   [Time : 3 Hours

Maximum : 75 Marks

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

UNIT - I

1 What is deforestation ? Enumerate and discuss the various effects of deforestation.   (15)

(OR)

2. Give a brief account of renewable energy resources and their significance.   (15)

UNIT - II

3 Define an ecosystem. Given an account of the structure and function of an ecosystem. (15)

(OR)

4. Explain the characteristics features and function of marine ecosystem.   (15)

UNIT - III

5 Discuss the status of India as a mega diverse nation of biodiversity.   (15)

(OR)

6. Explain *in-situ* and *ex-situ* conservation of biodiversity along with their merits and limitations.   (15)

UNIT - IV

7 Explain the various sources, effects and methods of control of water pollution.   (15)

(OR)

8. Discuss the role of an individual in preventing pollution.   (15)

UNIT - V

9 Discuss briefly on the reasons for the population explosion.   (15)

(OR)

10. Explain the role of information technology in the protection of the environment and human health.   (15)

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC-301. MATHEMATICS - II / III

00BS302- ENGINEERING MATHEMATICS - III

(*Common to ALL Branches*)

November]   [Time : 3 Hours

Maximum : 75 Marks

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

UNIT - I

1. (a) Obtain a partial differential equation by eliminating the arbitrary constants a, b, from the

   relation $z = xy + y\sqrt{x^2 - a^2} + b$.   (7)

   (b) Solve : $\dfrac{\partial^2 z}{\partial x^2} + 3\dfrac{\partial^2 z}{\partial x \partial y} - 4\dfrac{\partial^2 z}{\partial y^2} = x + \sin y$ (8)

2. (a) Solve the completely : $\quad z = px + qy + \sqrt{1 + a^2 + b^2}$ (7)

   (b) Solve : $\left(\dfrac{(b-c)}{a}\right)yzp + \left(\dfrac{(c-a)}{b}\right)xyq = \left(\dfrac{(a-b)}{c}\right)xy.$ (8)
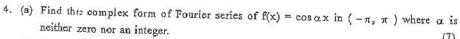
UNIT - II

3. (a) Find the Fourier series of period 2 for the function

   $$f(x) = K, \quad -1 < x < 0$$
   $$= x, \quad 0 < x < 1$$ (7)

   (b) Analyse harmonically the data given below and express y in Fourier series upto third harmonic :   (8)

x:	0	$\dfrac{\pi}{3}$	$\dfrac{2\pi}{3}$	π	$\dfrac{4\pi}{3}$	$\dfrac{5\pi}{3}$	2π
y:	1·0	1·4	1·9	1·7	1·5	1·2	1·0

4. (a) Find the complex form of Fourier series of $f(x) = \cos \alpha x$ in $(-\pi, \pi)$ where α is neither zero nor an integer. (7)

(b) Expand :

$$f(x) = \frac{1}{4} - x, \qquad 0 < x < \frac{1}{2}$$
$$= x - \frac{3}{4}, \qquad \frac{1}{2} < x < 1$$

as the Fourier series of sine terms. (8)

UNIT - III

5. A tank string of length l has its ends $x = 0$ and $x = l$ fixed. The point $x = \frac{l}{3}$ is drawn aside a small distance h, the displacement $y(x, t)$ satisfies $\frac{\partial^2 y}{\partial t^2} = a^2 \frac{\partial^2 y}{\partial x^2}$. Determine $y(x, t)$ at any time t. (15)

6. A rod of length l has its ends A and B kept at $0°$ C and $200°$ C respectively, until steady state conditions prevails. If the temperature at B is reduced to $0°$ C and kept so, while that of A is maintained. Find the temperature $u(x, t)$ at a distance x from A at any time t. (15)

UNIT - IV

7. Find the Fourier transform of $f(x)$, if

$$f(x) = 1, \quad |x| \le a$$
$$= 0, \quad |x| > a$$

and hence, find the value of $\int_0^\infty \frac{\sin x}{x} dx$ (15)

8. Find the cosine transformation of $e^{-a^2 x^2}$ and hence, find $F_s(xe^{-a^2 x^2})$. Also, show that $xe^{-x^2/2}$ is self reciprocal under Fourier sine transform. (15)

UNIT - V

9. (a) Find : $z\left[\frac{2n+3}{(n+1)(n+2)}\right]$. (8)

(b) If $z(u_n) = u(z) = \frac{2z^2 + 5z + 14}{(z-1)^4}$, evaluate u_2 and u_3. (7)

10. (a) Find : $z^{-1}\left[\frac{z^2 + 3z}{(z-1)^2 (z^2+1)}\right]$ by the method of partial function. (7)

(b) Solve : $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$

with $y_0 = y_1 = 0$, using z - transform. (8)

3654

B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(THIRD SEMESTER)

CLEC–304/PCLEC–104: ENGINEERING GEOLOGY

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit   (5 × 15 = 75)

UNIT – I

1. Discuss in detail about the various physical properties of minerals.

2. Write the physical properties of following minerals.

    (i) Mica   (ii) Pyroxene   (iii) Garnet.

UNIT – II

3. Brief discuss about the mode of formation of igneous rocks and explain their types.

4. Define sedimentary rock and write the importance of following rocks.

    (i) Sandstone   (ii) Limestone   (iii) Laterite   (iv) Marble.

UNIT – III

5. Discuss in detail about the various types of folds with neat sketch.

6. Write the short notes on following with neat sketch.

    (i) Dip   (ii) Strike   (iii) Overlap.

UNIT – IV

7. Briefly discuss about seismogram and seismograph with neat sketch.

8. Define landslides and explain about the various types of landslides and prevention methods.

UNIT – V

9. Draw the hydrological cycle and explain their components.

10. Discuss in detail about the various types of dam with neat sketch.

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(THIRD SEMESTER)

01ES-304. CONSTRUCTION ENGINEERING

(Common with Civil And Strucutral Engineering)

November]   [Time : 3 Hours

Maximum : 75 Marks

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

UNIT - I

1. Discuss in detail the various tests conducted on bricks to determine its suitability for construction work.

(OR)

2. Explain the different types of cement used in the construction industry.

UNIT - II

3. Explain the various types of shallow foundation with neat sketches.

(OR)

4. Discuss the determination of bearing capacity from standard penetration test.

UNIT - III

5. Explain in detail about the different types of stair with neat sketches.

(OR)

6. Define the masonry and discuss about the various types of stone masonry with neat sketch.

UNIT - IV

7. Define plastering. Give its types. Explain the procedure of plastering on new surfaces.

(OR)

8. Explain in detail about the various types of painting for interior and exterior surfaces.

UNIT - V

9. (a) Discuss about aluminium and its alloys.   (12)

    (b) Write the causes of cracks in building.   (3)

(OR)

10. (a) Briefly explain about the various equipment used for repairing works in buildings. (10)

    (b) Write a short notes on ceramics and PVC.   (5)

UNIT - I

1. (a) Explain the various types of cement in detail. (7)

   (b) Compare the physical properties of 33, 43 and 53 grade of concrete. (8)

2. Enumerate the various test employed for cement to ascertain its quality as per IS codes.(15)

UNIT - II

3. (a) Explain the effect of properties of aggregate on concrete. (8)

   (b) What is the effect of water cement ratio on strength and durability of concrete ? (7)

4. Explain the various tests to be done on fine aggregate and coarse aggregate. (15)

UNIT - III

5. Describe the procedure of any three tests conducted on workability of concrete. (15)

6. Describe the various types of concrete admixture and their uses. (15)

UNIT - IV

7. Explain the procedure of compressive, tensile and flexural strength tests conducted on concrete elements. (15)

8. (a) Describe the importance of creep and shrinkage. (8)

   (b) Define 'durability of concrete' and also, explain the factors affecting durability of concrete. (7)

UNIT - V

9. Design a concrete mix for M35 grade concrete using fly-ash .Adopt BIS method. Assume necesssary data. (15)

10. Enumerate the preliminary data required for mix design. Also, describe the mix design procedure as per IS code recommendation. (15)

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B.E. DEGREE EXAMINATION, 2018

(CIVIL ENGINEERING)

(THIRD SEMESTER)

01PC-306. MECHANICS OF FLUIDS

(Common with Civil and Strucutral Engineering)

November]

[Time : 3 Hours

Maximum : 75 Marks

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

UNIT - I

1   (a) Define specific volume and specific gravity. (3)

(b) If 5 m³ of oil weighs 40 kN, calculate the specific weight, density and specific gravity of the oil. (12)

2.   (a) Differentiate absolute pressure and gauge pressure. (3)

(b) An 'U' tube differential manometer is connected to two section of a horizontal pipe in which oil of specific gravity 0·8 is flowing. If the difference in mercury in the manometer is 60 cm, calculate the difference in pressure between the two sections. (12)

UNIT - II

3   (a) Explain the term total pressure and centre of pressure. (3)

(b) A triangular gate which has a base of 1·5 m and altitude of 2 m lies in a vertical plane. The vertex of the gate is 1m below the surface of a tank which contains oil of specific gravity 0·8. Find the force exerted by the oil on the gate and position of centre of pressure. (12)

4.   (a) Define meta centre. (3)

(b) Describe briefly the experimental method of determination of the meta centric height of a floating object. (12)

UNIT - III

5   (a) List the types of fluid flow. (3)

(b) In a two dimensional incompressible flow, the fluid velocity components are given by u = x – 4y and v = –y – 4x. Show that the velocity potential exists and also, obtain an expression for velocity potential function. (12)

6. (a) State the assumptions made in Bernoulli's equation. (3)

(b) Derive Euler's equation of motion along a stream line for an ideal fluid. Also, obtain Bernoulli's equilibrium from the Euler's equation. (12)

UNIT - IV

7 (a) Define an orifice and a mouth piece. (3)

(b) An orifice of diameter 200 mm is fitted at the bottom of the boiler drum of length 6·0 m and of diameter 2 m. The drum is horizontal and half full of water. Find the time required to empty the boiler. Take Cd = 0·6. (12)

8. (a) What are the advantages of triangular notch ? (3)

(b) Find the discharge through a trapezoidal notch which is 1·2 m wide at top and 0·50 m at the bottom and is 40 cm in height. The head of water on the notch is 30 cm. Assume Cd = 0·61. (12)

UNIT - V

9 (a) Differentiate major and minor head loss. (3)

(b) Derive an expression for the loss of energy due to friction in pipes. (12)

10. (a) What do you understand by "turbulent flow" ? (3)

(b) The difference in water surface levels in two tanks which are connected in series of length 300 m, 170 m and 210 m and of diameter 300 mm, 200 mm and 400 mm respectively is 12 m. Determine the rate of flow of water if co-efficient of frictions are 0·005, 0·0053, 0·0047 respectively. (12)