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Pages: 5

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R, S) / S6 (PT) (R) Examination June 2023 (2019 Scheme)

Course Code: CET308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50 Duration: 1Hour

Instructions: ***(1) Each question carries one mark. No negative marks for wrong answers***
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation

1. What will be the relation between Modulus of Elasticity 'E' and Bulk modulus 'K' , when Poisson's ratio = 0.25

a) E =K b) E =2K c) E = 1.5K d) E =K=0

2. The radius of Mohr's circle for two equal unlike principal stresses of magnitude σ is

a) σ b) $\frac{\sigma}{2}$ c) Zero d) None of these

3. The area under the stress strain curve represents

a) Breaking strength of material b) Toughness of material c) Hardness of material d) Energy required to cause failure

4. Two bars of different materials and same size are subjected to same tensile force. If the bars have unit elongation in the ratio 2:5, then the ratio of modulus of elasticity of the two materials will be

a) 2:5 b) 5:2 c) 4:3 d) 3:4

5. Shear centre of a section is defined as that point

a) At which load must be applied to produce zero twisting moment on the section b) At which shear force is zero c) At which shear force is maximum d) At which shear force is minimum

6. If principal stresses in a two dimensional case are (-)10MPa and 20MPa respectively, then maximum shear stress at the point is

a) 10 MPa b) 15 MPa c) 20 MPa d) 30 MPa

7. Shear stress on principal plane is

a) Zero b) Maximum c) Minimum d) None of these

8. The shear force diagram of a cantilever beam of length l carrying uniformly distributed load of w per unit length will be

a) a right angled triangle b) an isosceles triangle c) an equilateral triangle d) a rectangle

9. A beam of uniform strength has at every cross section same

a) Shear stress b) Bending stress c) Deflection d) Stiffness

10. Rate of change of bending moment is equal to

a) Shear force b) deflection c) Slope d) Rate of loading

11 Two tanks A and B with the same height are filled with water. The volume of Tank A is 10 times the volume of Tank B. What will be the relation between pressures P_A and P_B at the bottom of the tanks A and B respectively?

a) $P_A = 10P_B$ b) $P_B = 10\,P_A$ c) $P_A = P_B$ d) Insufficient Data

12 The type of fluid flow in which the flow and fluid properties does not change with time at any given location is known as

a) Non – Uniform Flow b) Rotational Flow c) Steady Flow d) Unsteady Flow

13 Property of a fluid by which molecules of different kinds of fluids are attracted to each other is called

a) Adhesion b) Cohesion c) Viscosity d) Compressibility

14 Calculate the specific energy of the flow if the velocity of the flow is 2.22 m/sec and depth of flow is 1m.

a) 1.25 b) 2.22 c) 3.22 d) 4.22

15 The Reynold's number for a pipe flow is 6000, then the type of flow is

a) Laminar b) Turbulent c) Transitional d) Vortex

16 The discharge over rectangular notch is

a) Directly proportional to $H^{3.5}$ b) Directly proportional to $H^{1.5}$ c) Directly proportional to $H^{4.5}$ d) Directly proportional to $H^{2.5}$

17 The property of fluid by virtue of which it offers resistance to flow is called

a) Surface tension b) Adhesion c) Viscosity d) Cohesion

18 The point in the immersed body through which the resultant pressure of the liquid may be taken to act is known as

a) Centre of rigidity b) Centroid c) Centre of buoyancy d) Centre of gravity

19 A manometer is used to measure

a) Velocity b) Pressure c) Discharge d) Humidity

20 Hydraulic radius is given by

a) Wetted perimeter divided by area b) Area divided by square of wetted perimeter c) Area divided by wetted perimeter d) Square root of area

21 If the distance between instrument station and staff station is 1km, the correction for refraction in meter is

a) 0.0673 b) 0.0785 c) 0.0112 d) 0.0211

22 Sag correction is always

a) Positive b) Negative c) Zero d) None of these

23 Whole circle bearing 338 ^{O}42' converted into quadrant form is given as

a) N21°18'W b) S21°18'E c) W21°18'N d) None of these

24 Angle of dip at pole is

a) 0° b) 90° c) 45° d) 30°

25 A 10 cm theodolite means that

a) Length of its telescope is 10cm b) Height of the telescope is 10 cm c) Diameter of the graduated circle of its lower plate is 10 cm d) Diameter of the graduated circle of its vertical circle is 10 cm

26 If reduced bearing of line AB is N30W and length is 100m, then latitude and departure respectively of the line AB will be

a) +86.6 m, +50m b) +50m, +86.6m c) +86.6m, -50 m d) -86.6m, +50m

27 The true bearing of a line is 34^{0}20' and the magnetic declination at the place of observation is 2°W on the date of observation. Magnetic bearing of the line is

a) 36°20' b) 34°20' c) 32°20' d) 32°

28 The vertical distance between any two consecutive contours is called

a) Vertical equivalent b) horizontal equivalent c) Contour interval d) Contour gradient

29 The system that uses the sun as source of electromagnetic energy and records the naturally radiated and reflected energy from the object is

a) Geographical Information System b) Global Positioning system c) Active remote sensing d) Passive remote sensing

30 The minimum number of satellites needed for a GPS to determine its position precisely

a) 2 b) 3 c) 4 d) 24

31 A soil sample has a void ratio of 0.5 and its porosity will be closed to

a) 50% b) 66% c) 100% d) 33%

32 The void ratios at the densest (e_{min}), loosest (e_{max}), and the natural states(e) of a sand deposit are 0.2, 0.6 and 0.4 respectively. The relative density of the deposit is

a) 100 % b) 75% c) 50% d) 25%

33 Read the following statements related to IS light compaction test.
I. Soil is always compacted in 3 layers in the compaction mould.
II. Each layer is always given 25 blows.
Select the correct answer from among the following:

a) Statement I is TRUE and Statement II is FALSE b) Statement II is TRUE and Statement I is FALSE c) Both Statements are TRUE d) Both Statements are FALSE

34 The Liquid Limit(LL),Plastic Limit(PL) and Shrinkage Limit(SL) of a cohesive soil satisfy the relation

a) LL>PL>SL b) LL>PL<SL c) LL<PL>SL d) LL<PL<SL

35 Quick sand is occurring when its

a) Effective pressure is reduced to zero b) Effective pressure is equal to atmospheric pressure c) Effective pressure is equal to Seepage pressure d) None of these

36 Consolidation of soil is due to a load which is

a) Static b) Dynamic c) Dynamic and long term d) Static and long term

37 Hydrometer is an instrument used for the measurement of

a) Viscosity b) Specific Gravity c) Volume d) Weight

38 The specific gravity and in-situ void ratio of soil deposit are 2.71 and 0.85 respectively. The value of critical hydraulic gradient is

a) 0.82 b) 0.85 c) 0.92 d) 0.80

39 Slope of e-log p curve for a soil mass gives

a) Coefficient of permeability b) Coefficient of volume compressibility c) Compression Index d) Coefficient of consolidation

40 For compacting heavy clays and silty clays, which of the following method are found to be very effective

a) Vibro tampers b) Sheepsfoot Roller c) Smooth wheel rollers d) None of these

41 Initial setting time of cement is increased by adding

a) Aluminium oxide b) Gypsum c) Magnesium Oxide d) Alkalies

42 Rapid hardening Portland cement has

a) Low heat of hydration b) Higher heat of hydration c) Lower shrinkage coefficient d) Lower compressive strength

43 Slump test of concrete is used to measure

a) Workability b) Compressive strength c) Impact value d) Initial setting time

44 The type of masonry in which the stones of irregular size and shape are used and there are no regular courses is known as

a) Uncoursed rubble masonry b) Ashlar masonry c) Random rubble masonry d) Dry rubble masonry

45 What is used to ensure uniform thickness of plastering

a) Bull point b) Pivot point c) Bull mark d) Bench Mark

46 Which of the following is NOT a Bogues compound

a) Tri calcium silicate b) Di calcium silicate c) Tri calcium aluminate d) Di calcium aluminate

47 The property of fresh concrete in which water in the mix tends to rise to the surface while placing and compaction is called

a) Bleeding b) Creep c) Segregation d) Shrinkage

48 Which of the following defect is caused by vaporization of entrapped moisture or solvents in painted surface

a) Saponification b) Blistering c) Blooming d) Cissing

49 Critical activity has

a) Maximum float b) Minimum float c) Zero float d) Average float

50 An activity has optimistic, most likely and pessimistic times as 2,3 and 7respectively, then its expected time is

a) 3 b) 3.5 c) 4 d) 4.5

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