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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S6 (PT) (S) Examination January 2024 (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. Hooke's law holds good up to -------

a) Yield point b) Ultimate stress point c) Limit of proportionality d) Elastic limit

2. Relationship connecting Young's modulus € and Bulk modulus (K) is -------

a) $E = 3K(1-2\mu)$ b) $E = 2K(1+2\mu)$ c) $E = 3K(1-\mu)$ d) $E = 3K(1+\mu)$

3. When a copper wire of length 2 m and diameter 40 mm is subjected to an axial pull of 80 Kn, its diameter reduces by 0.00775 mm and length increased by 1.2 mm. Calculate the Poisson's ratio of the wire.

a) 0.22 b) 0.13 c) 0.32 d) 0.35

4. What will be the value of Young's modulus, if a material has Poisson's ratio 0.25 and Shear modulus 100 Mpa?

a) 250 Mpa b) 225 Mpa c) 175 MPa d) 300 MPa

5. The shear force diagram for a simply supported beam carrying a uniformly distributed load of 'w' N/m consists of

a) One right angled triangle b) One equilateral triangle c) Two right angled triangles d) Two equilateral triangles

6. Point of contraflexure is the point

a) at which shear force diagram changes its sign b) at which bending moment diagram changes its sign c) of maximum shear force d) of maximum bending moment

7. The maximum value of bending moment for a cantilever beam of length 'l' m carrying uniformly distributed load of intensity 'w' N/m throughout the span is -------

a) $\frac{wl^2}{2}$ b) $\frac{wl^2}{8}$ c) $\frac{wl^2}{3}$ d) $\frac{wl^2}{12}$

8. The section modulus for a triangle section of width 'b' and height 'h' will be -------

a) $\frac{bh^2}{16}$ b) $\frac{bh^2}{12}$ c) $\frac{bh^2}{36}$ d) $\frac{bh^2}{24}$

9. The maximum shear stress in a rectangular cross section is ------- average shear stress

a) 1.25 times b) 1.3 times c) 1.5 times d) 0.5 times

10. The value for shear stress in principle plane is -------

a) One b) Maximum c) Zero d) Negative

11. Bernoulli's equation is applicable for

a) Viscous and compressible fluid flow b) Inviscid and compressible fluid flow c) Inviscid and incompressible fluid flow d) Viscous and incompressible fluid flow

12. In a two-dimensional steady flow filed, in a certain region of the *x-y* plane, the velocity component in the x-direction is given by $v_x = x^2$ and the density varies as $\rho = 1/x$. Which of the following is a valid expression for the velocity component in the y-direction, v_y?

a) $v_y = -\frac{x}{y}$ b) $v_y = \frac{x}{y}$ c) $v_y = -xy$ d) $v_y = xy$

13. The continuity equation is based on the principle of

a) Conservation of mass b) Conservation of momentum c) Conservation of energy d) Conservation of force

14. Darcy- Weisbach equation gives relation between -------

a) Pressure and temperature b) Mass, volume and pressure c) Head loss and pressure loss d) Pressure loss only

15. Which property of the fluid accounts for the major losses in pipes?

a) Density b) Specific gravity c) Compressibility d) Viscosity

16. For a channel to be economic which of the following parameters should be minimum.

a) Wetted perimeter b) Wetted area c) Section factor d) Hydraulic depth

17. Find the hydraulic depth for a most economical circular channel section in case of maximum velocity.

a) 0.2D b) 0.3D c) 0.4D d) 0.5D

18. Hydraulic jump is observed in ---------

a) Closed channel flow b) Open channel flow c) Flow changes d) Volumetric changes

19. During a subcritical flow, what is the value of Froude's number?

a) Zero b) Greater than one c) Less than one d) Not defined

20. The base width of a rectangular channel is 4 m and the maximum discharge through the channel is 10 m^3/s, calculate the specific energy.

a) 0.7m b) 1.0m c) 1.3m d) 1.6m

21. A well-conditioned triangle has angles not less than ---- and more than ----- respectively

a) 10° and 90° b) 20° and 120° c) 90° and 120° d) None of these

22. If magnetic bearing of sun at noon at a place in southern hemisphere is 150°, then magnetic declination at that place is

a) 30° E b) 30° W c) 20° E d) 20° W

23. A 10 cm theodolite means that

a) Length of its telescope is 10 cm
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

24. Any arbitrarily assumed level line from which vertical distances are measured is called

a) Level line b) Vertical line c) Horizontal line d) Datum line

25. Error due to eccentricity of inner and outer axis can be eliminated by

a) Taking mean of both the face observations
b) Reading both verniers and taking the mean of the two observations
c) Taking several readings distributed over different positions of the graduated circle
d) None of these

26. If L is latitude and D is departure, then closing error is given by

a) $\sqrt{\sum L^2 + \sum D^2}$ b) $\sqrt{\sum L + \sum D}$ c) $\sqrt{\sum L^2 - \sum D^2}$ d) None of these

27. If Δ is angle of deflection of a simple curve of radius R, then length of its long chord is

a) $R \sin\frac{\Delta}{2}$ b) $2R \sin\frac{\Delta}{2}$ c) $R \cos\frac{\Delta}{2}$ d) $2R \cos\frac{\Delta}{2}$

28. An observer standing on the deck of ship just sees the top of a lighthouse which is 30 m above the sea level. If the height of the observer's eye is 10 m above the sea level, then the distance of the observer from the lighthouse will be nearly

a) 22.5 km b) 24.3 km c) 33.3 km d) 59.7 km

29. Two points A and B are 1530 m apart across a river. The reciprocal levels measured are:

Level at	Readings on (m)	
	A	B
A	2.165	3.810
B	0.910	2.355

What is the true difference in level between A and B?

a) 1.255 m b) 1.455 m c) 1.545 m d) 1.645 m

30. The limits of water level in a river represents a

a) Contour line b) Horizontal surface c) Contour gradient d) None of these

31. The void ratio and specific gravity of a soil sample are 0.65 and 2.72 respectively. The degree of saturation corresponding to a water content of 20 % is

a) 65.3 b) 20.9 c) 83.7 d) 54.4

32. Which of the following method is more suitable for the determination of permeability of a coarse-grained soil

a) Constant head method b) Falling head method c) Horizontal permeability test d) Pumping out test

33. A coarse-grained soil has a void ratio 0.75, and specific gravity as 2.75. The critical gradient at which quick sand condition occurs is

a) 0.25 b) 0.5 c) 0.75 d) 1.00

34. The total and effective stresses at a depth of 5 m below the top level of water in a swimming pool are ---------- and ---------respectively.

a) 0.5 kg/cm^2 and zero b) zero and zero c) 0.5 kg/cm^2 and 0.5 kg/cm^2 d) None of the above

35. The ratio of unconfined compressive strength of an undisturbed soil sample to that of a remoulded sample at the same water content, is ------

a) Activity b) Damping c) Plasticity d) Sensitivity

36. Toughness index is defined as the ratio of

a) Plasticity index to flow index b) Plasticity index to consistency index c) Liquidity index to flow index d) None of the above

37. Porosity and void ratio are related by:

a) $e = \frac{n}{1-n}$ b) $n = \frac{e}{1-e}$ c) 1- e = n d) $\frac{1+n}{n} = e - 1$

38. For a fully saturated soil sample, the degree of saturation is ------

a) 0 b) 0.5 c) 0.8 d) 1

39. The law which governs the permeability of a soil is

a) Darcy's law b) Terzaghi's theorem c) Stoke's law d) Mohr Coulomb theory

40. Most accurate method for the determination of water content of soil is

a) Sand bath method b) Pycnometer method c) Alcohol method d) Oven drying method

41. The component in cement which is responsible for the early age strength of concrete is -------

a) C_2S b) C_3A c) C_3S d) C_4AF

42. The strength of concrete below which not more than 5 % of the test results ae expected to fall is -------

a) Compressive strength b) Characteristic compressive strength c) Split tensile strength d) Ultimate strength

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

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

44. For protecting the metal surfaces against rusting, the most suitable type paint is ------

a) Emulsion paint b) Cellulose paint c) Asbestos paint d) Aluminium paint

45. Which of the following concept is not suitable for cavity wall construction?

a) Reliable sound insulation b) Effective thermal comfort c) Lower maintenance cost d) High self - weight

46. Which among the following is the benefits of prefabricated construction?

a) Inferior Quality control b) Time savings c) Higher cost d) Lesser flexibility

47. Of the following which among is the causes of failure of RCC Structures?

a) Corrosion b) Over loading c) Accidental loading d) All the above

48. For ------- contract the contractor need to quote rates for each item based on bill of quantities.

a) Lump sum contract b) Item rate contract c) Turn key contract d) BOT contract

49. For a particular type of work only one contractor has qualified in the prequalification process. What type of tender shall be submitted for the work by such a contractor?

a) Open tender b) Limited tender c) Single tender d) Rate contract tender

50. For an activity in the critical path the total float shall be the value -------

a) LFT – EFT b) LFT – EST c) EFT – LST d) EST - duration

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