Set 1

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA

Entrance Exam. For Ph. D. (Civil Engineering)

Q1. If the Poison's ratio for a material is 0.5, then the elastic modulus for the material is
   a. Three times its shear modulus
   b. Four times its shear modulus
   c. Equal to its shear modulus
   d. Not determinable

Q2. A simply supported beam AB of span L carries two concentrated loads W each at points L/3 from A and B. What is the shear force in the middle one-third portion of the beam?
   a. W/2
   b. 2W
   c. W
   d. Zero

Q3. A statically determinate structure is the one which
   a. cannot be analyzed at all
   b. can be analyzed using equations of statics only
   c. can be analyzed using equations of statics and compatibilty equations
   d. can be analyzed using equations of compatibilty only

Q4. What is the shape of influence line diagram for the maximum bending moment in respect of a simply supported beam?
   a. Rectangular
   b. Triangular
   c. Parabolic
   d. Circular

Q5. The moment-distribution method in structural analysis falls in the category of
   a. Displacement method
   b. Force method
   c. Flexibility method
   d. First order approximate method

Q6. A plate used fopr connecting two or more structural members intersecting each other is termed as
   a. Template
   b. Base plate
   c. Gusset plate
   d. Shoe plate

Q7. As per IS code, the maximum longitudinal pitch allowed in bolted joints of tension members is nominally
   a. 12 times the thickness of the plate
   b. 12 times the diameter of the bolt

c. 16 times the thickness of the plate
d. 16 times the diameter of the bolt

Q8. Which one of the following sections performs better on the ductility criterion.
a. Balanced section
b. Over-reinforced section
c. Under-reinforced section
d. Non-prismatic section

Q9. For a given activity, the optimistic time, pessimistic time and the most probable estimates are 5, 17 and 8 days respectively. The expected time is
a. 8 days
b. 9 days
c. 10 days
d. 11 days

Q10. Which one of the following relates to critical path in PERT.
a. Event-oriented slack
b. Activity-oriented slack
c. Event-oriented float
d. Activity-oriented float

Q11. For one cubic metre of brick masonry, the number of modular bricks needed is
a. 400 or less
b. 400 to 450
c. 500 to 550
d. 600 to 650

Q12. The approximate ratio between the strengths of cement concrete at 7 days and 28 days is
a. 3/4
b. 2/3
c. 1/2
d. 1/3

Q13. An accurate estimate of average rainfall in a particular catchment area can be obtained by
a. arithmetic mean method
b. Isohyetal method
c. normal ratio method
d. Thiessen method

Q14. Leaching is a process
a. by which alkali salts present in the soil are dissolved and drained away
b. by which alkali salts present in the soil come up with water
c. of draining excess water of irrigation
d. which controls water-logging

Q15. Khosla's formulae for assessing pressure distribution under weir floors are based on
a. Potential flow in permeable layers just beneath the floors

b. Boundary layer flow with pressure drop longitudinally
c. Conformal transformation of potential flow into the w plane
d. Simplification of 3-D flow

Q16. In which of the following industries, the water requirement in kilo litres per unit of production is very high?
a. Paper indusry
b. Steel industry
c. Sugar industry
d. Fertilizer industry

Q17. A water supply distribution system for an averagely-populated township has to be designed for
a. Maximum daily demand
b. Maximum hourly demand and fire demand
c. Average demand
d. Maximum daily demand and fire demand, or Maximum hourly demand, whichever is higher

Q18. In a water treatment plant, dissolved iron nad manganese can be removed from the water by
a. aeration
b. aeration and coagulation
c. aeration and flocculation
d. aeration and sedimentation

Q19. Which one of the following tests of water/wastewater employs Enichrome Black T as an indicator?
a. Hardness
b. COD
c. Residual chlorine
d. DO

Q20. For fish habitat in a river, the minimum dissolved oxyger required is
a. 2mg/L
b. 4mg/L
c. 8mg/L
d. 10 mg/L

Q21. In urban air pollution, the most poisonous gas is supposed to be carbon monoxide. It is hazardous because it
a. affects our sense of smell
b. is carcinogenic in nature
c. combines with haemoglobin
d. causes blindness

Q22. Acoustics of an auditorium is considered to be excellent when its reverbation time is between
a. 0.50 and 1.50 s

b. 1.50 and 2.00 s
c. 2.00 and 3.00 s
d. 3.00 and 5.00 s

Q23. The porosity, n of a soil is
a. e/1+e
b. e/1-e
c. e+1/e
d. e-1/e

Q24. Given that coefficient of curvature = 1.4, D30 = 3mm, D10 = 0.6mm, based on this information of particle size distribution for use as subgrade, this soil will be taken to be
a. uniformly graded sand
b. well-graded sand
c. very fine sand
d. poorly-graded sand

Q25. Sheep-foot rollers are recommended for compacting
a. granular soils
b. cohesive soils
c. hard rock
d. any type of soil

Q26. The earth pressure behind a bridge abutment is
a. Active
b. Passive
c. At rest
d. Constant always and everywhere

Q27. The bearing capacity factors Nc, Nq and Nγ are functions of
a. width and depth of footing
b. density of soil
c. cohesion of soil
d. angle of internal friction of soil

Q28. In the Engineering News Record formula for determining the safe load carrying capacity of a pile, the factor of safety is
a. 2.5
b. 3
c. 4
d. 6

Q29. A soil sampler has inner and outer radii of 25 mm and 30mm, respectively. The area ratio of the sampler is
a. 24%
b. 34%
c. 44%

d. 54%

Q30. Offests are
a. lateral measurements made with respect to main survey lines
b. perpendiculars erected from chain lines
c. taken to avoid unnecessary walking between stations
d. measurements which are not made at right angles to the chain line

Q31. The method of orienting a plane table with two inaccessible points is known as
a. intersection
b. resection
c. back sighting
d. two-point problem

Q32. What is the minimum number of satellites required from which signals can be recorded to enable a global positioning system receiver to determine latitude, longitude and altitude.
a. One
b. Two
c. Three
d. Four

Q33. The damp proof course (D.P.C) is measured in
a. cubic metre
b. square metre
c. metre
d. none of these

Q34. International Traffic Intelligent Survey Data are related with
a. Origin and destination studies
b. Speed and delay studies
c. Classified traffic volume studies
d. Accident profiling studies

Q35. Which one of the following is useful in functional evaluation of pavement?
a. PCU
b. PSI
c. PIEV
d. Bankelman beam

Q36. California Bearing Ration (CBR) is
a. measurement of soil strength
b. method of soil identification
c. measure to indicate the relative strength of paving materials
d. measure of shear strength under lateral confinement

Q37. The amount of mechanical energy imposed to the aggregates during the aggregate impact test is of the order of
a. 5320 kg-cm

b. 6750 kg-cm
c. 7980 kg-cm
d. 11400 kg-cm

Q38. Which one of the following binders is recommended for a wet and cold climate?
a. 80/100 penetration asphalt
b. Tar
c. Cutback
d. Emulsion

Q39. Which one of the following tests is performed in the laboratory to determine the extent of weathering of aggregates for roadworks?
a. Soundness Test
b. Crushing Test
c. Impact Test
d. Abrasion Test

Q40. The terminal velocity of a sphere settling in a viscous fluid varies as
a. the Reynolds number
b. the square of its diameter
c. directly proportional to the viscosity of fluid
d. its diameter

Set 1

Civil

ANSWER KEY

1.	a
2.	d
3.	c
4.	c
5.	a
6.	c
7.	c
8.	c
9.	c
10.	a
11.	c
12.	b
13.	b
14.	a
15.	c
16.	a
17.	d
18.	d
19.	a
20.	b
21.	c
22.	a
23.	a
24.	b
25.	b
26.	c
27.	d
28.	d
29.	c
30.	a
31.	d
32.	d
33.	b
34.	c
35.	b
36.	c
37.	c
38.	c
39.	a
40.	b