MIZORAM PUBLIC SERVICE COMMISSION

DEPARTMENTAL EXAMINATIONS FOR
JUNIOR ENGINEER / DRAFTSMAN-I
UNDER PUBLIC HEALTH ENGINEERING DEPARTMENT, JANUARY 2016

CIVIL ENGINEERING PAPER – II

Time Allowed : 3 hours   FM : 100 PM : 40

All questions carry equal marks of 2 each.
Attempt all questions.

1. A Rock forming mineral which is also known as Black mica is
   - (a) Olivine
   - (b) Muscovite
   - (c) Dolomite
   - (d) Biotite

2. Which of the following is among the harmful ingredients in Brick earth?
   - (a) Iron pyrites
   - (b) Alumina
   - (c) Oxide of iron
   - (d) Silica

3. The standard size of Brick including mortar thickness is
   - (a) 19cm×9cm×9cm
   - (b) 20cm×10cm×10cm
   - (c) 19cm×10cm×10cm
   - (d) 20cm×9cm×9cm

4. The wall thickness of hollow brick is generally
   - (a) 15mm to 20mm
   - (b) 18mm to 22mm
   - (c) 20mm to 25mm
   - (d) 22mm to 26mm

5. Smith's test is performed in a stone sample to find out
   - (a) Presence of soluble matter
   - (b) Crushing strength
   - (c) Hardness
   - (d) Rate of wearing

6. The type of foundation suitable where bearing capacity of soil is low or other loaded areas are so close in both directions that individual footing would nearly touch each other is
   - (a) Spread footing or Pad foundation
   - (b) Strap footing
   - (c) Raft or Mat foundation
   - (d) Combined footing

7. If the axial load including self weight of footing is 750 kN and the bearing capacity of soil is 300 kN/sqm. The area of footing required would be
   - (a) 2.00 sqm
   - (b) 2.50 sqm
   - (c) 3.00 sqm
   - (d) 3.50 sqm

8. The minimum gross pressure intensity at the base of the foundation at which the soil fails in shear is called
   - (a) Safe bearing capacity
   - (b) Net safe bearing capacity
   - (c) Net ultimate bearing capacity
   - (d) Ultimate bearing capacity

9. The general value of safe bearing capacity of medium clay readily indented with a thumb nail is
   - (a) 100 kN/sqm
   - (b) 150 kN/sqm
   - (c) 250 kN/sqm
   - (d) 450 kN/sqm

10. The minimum thickness of the footing at the edge shall not be less than

    (a) 150mm   (b) 175mm

    (c) 180mm   (d) 200mm

11. In a plain sedimentation for treatment of water, particles entirely removed will be

    (a) which settle at velocities equal to surface overflow rate

    (b) which settle at velocities equal to or less than surface overflow rate

    (c) which settle at velocities equal to or greater than surface overflow rate

    (d) None of these

12. Which kind of the following sedimentation tanks minimizes the effect of inlet and outlet disturbances?

    (a) Rectangular   (b) Circular

    (c) Square   (d) Elliptical

13. Which of the following processes may be omitted in treating water of low turbidity and industrial processed water in a rapid filtration?

    (a) Coagulation   (b) Flocculation

    (c) Disinfection   (d) Clarification

14. The size of filter media in water treatment plant is specified by

    (a) Standard size   (b) Nominal size

    (c) Effective size   (d) None of these

15. Aeration in connection with water treatment process is used in

    (a) Pre-chlorination   (b) Break point chlorination

    (c) De-chlorination   (d) Plain chlorination

16. Which of the following sources of water will have the least turbidity?

    (a) Ground water   (b) Lake water

    (c) Stream in dry water   (d) Stream in flood

17. Turbidity in water supply may be removed by

    (a) Chlorination

    (b) Sedimentation with or without chemical coagulant and filtration

    (c) Cation-exchange method

    (d) Radio-isotope removal

18. According to the International standards for drinking water, 3rd edition, WHO, Geneva, 1971, the highest desirable pH level is

    (a) 6.0 to 6.5   (b) 6.5 to 7.0

    (c) 7.0 to 8.0   (d) 7.5 to 8.5

19. Discoloration of clothes and plumbing fixtures and incrustations in water mains is caused by

    (a) Chlorides   (b) Algae

    (c) Dissolved oxygen   (d) Iron

20. The electrode used in the standard method of measuring pH value is

    (a) Glass   (b) Hydrogen

    (c) Nickel   (d) Mica

21. Which of the following population forecasting methods assumes a constant rate of growth?

    (a) Uniform percentage method   (b) Curvilinear method

    (c) Logistic method   (d) Arithmetic method

22. Which of the following water use would demand a high rate for short period?

    (a) Very large fire   (b) Schools

    (c) Commercial and Industrial   (d) Flushing streets

23. 'Un-accounted for' water in water distribution system is due to

    (a) Public buildings   (b) Jails

    (c) Meter and pump slippage   (d) All of these

24. If the average increase in population of a city during the years 1990, 2000 and 2010 is 2,00,000 and the population of the city in 2010 is 5,00,000. What would be the projected population of the city in the year 2020 using Arithmetic incremental method?

    (b) 5,20,000   (b) 7,00,000

    (c) 7,20,000   (d) 8,50,000

25. Which of the following is/are the factor(s) affecting water consumption?

    (a) Size of the city   (b) Characteristics of population

    (c) Efficiency of water works management   (d) All of these

26. The chemical reaction of cement with water, by virtue of which cement becomes a bonding agent is known as

    (a) Incineration   (b) Oxidation

    (c) Hydration   (d) Hardening

27. Plasticizer in cement concrete mix is added to

    (a) increase workability without an increase in water content

    (b) increase workability with corresponding increase in water content

    (c) increase workability with corresponding decrease in water content

    (d) None of these

28. Construction of temporary structure to support temporarily an unsafe structure in a civil engineering works is called

    (a) Formwork   (b) Shoring

    (c) Scaffolding   (d) Underpinning

29. To avoid Alkali-Aggregate reaction in cement concrete work, the aggregates used should not contain

    (a) Sodium oxide   (b) Potassium oxide

    (c) Ferrous minerals   (d) Siliceous minerals

30. The minimum cement content for M20 grade concrete is

    (a) 250 kg/cum   (b) 300 kg/cum

    (c) 400 kg/cum   (d) 450 kg/cum

31. The minimum cover for 2.0 hour fire rating in continuous RCC beams is

    (a) 30 mm   (b) 40 mm

    (c) 50 mm   (d) 55 mm

32. The recommended curing period for Portland Pozzolana Cement concrete (PPC) to attain full strength for concrete exposed to dry and hot weather condition is

    (a) 7 days   (b) 10 days

    (c) 14 days   (d) 28 days

33. If Ø denotes the diameter of steel reinforcement, as a rough rule, full anchorage of steel stressed to ultimate strength, for tension, may be taken as

(a) 30 Ø   (b) 32 Ø

(c) 40 Ø   (d) 41 Ø

34. The RCC slab will behave as two-way slab if the ratio of longer to shorter span is

(a) >1 (b) <1

(c) >2 (d) <2

35. The pitch of lateral ties in RCC columns should not exceed

(a) 300 mm   (b) 350 mm

(c) 400 mm   (d) 450 mm

36. The Indian standard codes and provisions prescribed for designing water retaining structures is/are

(a) IS:3370   (b) IS:456-2000

(c) IS:3370 & IS:456-2000   (d) IS:1893-2002 & IS:456-2000

37. The grade of cement not to be used in the construction of RCC water tank is

(a) 53 Grade   (b) 43 Grade

(c) 33 Grade   (d) None of these

38. The soffit formwork to Ring beam of RCC Overhead water tank can be removed after

(a) 3 days   (b) 10 days

(c) 21 days   (d) 28 days

39. The minimum cement concrete grade for all RCC members of water retaining structures in touch with liquid or encasing the liquid shall be

(a) M 25   (b) M 30

(c) M 35   (d) M 40

40. Which of the following is provided in water tank for easy feeding of water into the pipe?

(a) Puddle piece with collar   (b) Duck foot bend

(c) Ventilator   (d) Bell mouth

41. The design period of a sewer system should be

(a) 10 years   (b) 15 to 20 years

(c) 20 to 40 years   (d) Indefinite

42. Sanitary sewers are designed to carry

(a) Sanitary sewage

(b) Industrial waste produced by community

(c) Only such ground, surface and storm water as may enter through poor joints, around manhole covers and through other deficiencies

(d) All of these

43. The pipe which is installed in the house drainage to preserve the water seal of traps is called

(a) Soil pipe   (b) Anti-Siphonage pipe

(c) Waste pipe   (d) Vent pipe

44. Which of the following is not among the components of every rainwater catchment systems?

(a) A delivery system   (b) A storage reservoir

(c) A bore well to recharge the ground water   (d) None of these

45. Which of the following types of roof would be most desirable for harvesting rainwater?

   (a) Unpainted and uncoated roofs   (b) Thatched roofs such as Palms and Grasses

   (c) Mud roofs   (d) Acrylic painted roofs

46. As a general guide to gutter dimensions in relation to roof area, a useful thumb rule is to make sure, for every sqm of roof area, provision of

   (a) 5 sqcm gutter cross section   (b) 10 sqcm gutter cross section

   (c) 15 sqcm gutter cross section   (d) 20 sqcm gutter cross section

47. Amoebic dysentery is an infection of waterborne communicable disease due to the presence of

   (a) Bacteria   (b) Viruses

   (c) Protozoan   (d) None of these

48. Methemoglobinemia is caused by consumption of water by infants contaminated with

   (a) Lead   (b) Nitrates

   (c) Oxides   (d) Fluoride

49. The disposal of sewage by discharging it into water courses such as streams is called

   (a) Primary treatment   (b) Secondary treatment

   (c) Land treatment   (d) Dilution

50. The most common evaporation system of sewage disposal is

   (a) Oxidation pond   (b) Stream disposal

   (c) Rapid infiltration   (d) Ocean discharge

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