Rajasthan Public Service Commission - 2016

Paper : 69-Asstt-Engineer-Civil

Ques # :1

Fly ash is residue generated from :-

1) Chemical Industries
2) Hydel Power Plant
3) Nuclear Power Plants
4) Thermal Power Plants

Ques # :2

Marble is a :-

1) Igneous Rock
2) Sedimentry Rock
3) Metamorphic Rock
4) Granite Rock

Ques # :3

The two main compounds of ordinary Portland cement are :-

1) Tricalcium silicate and dicalcium silicate
2) Dicalcium Silicate and alkali oxide
3) Tricalcium aluminates and alkali oxide
4) Tricalcium silicate and alkali oxide

Ques # :4

Which component has highest percentage in good brick earth :-

1) alumina
2) lime
3) silica
4) oxide of iron

Ques # :5

The strength of concrete is directly proportional :-

1) Water Cement Ratio
2) Cement water ratio
3) Sand Cement Ratio
4) Water aggregate Ratio

Ques # :6

The commonly used lime in white washing is :-

1) Hydraulic Lime
2) Fat Lime
3) Plain Lime
4) None of These

Ques # :7

A metallic tape is of :-

1) Steel
2) Invar
3) Linen
4) Cloth and Wires

Ques # :8

If the quadrantal bearing of a line is N 25° W, then the whole circle bearing of the line is :-

1) S 25° E
2) 205°
3) 335°
4) 295°

Ques # :9

For a well-conditioned triangle , an angle should not be less than :-

1) 20°
2) 30°
3) 45°
4) 60°

Ques # :10

Cross staff is an instrument used for :-

1) Measuring approximate horizontal angles
2) Setting out right angles
3) Measuring bearings of the line
4) None of These

Ques # :11

It is the axis about with the instrument can be rotated in a horizontal plane.

1) Trunion axis
2) Horizontal axis
3) Axis of the Telescope

4) Vertical axis

Ques # :12

In compass survey , the dip of the needle at equator will be :-

1) Zero
2) 90°
3) 45°
4) None of These

Ques # :13

The maximum bending moment (M) caused by a concentrated load (W) at the mid span of a simply supported beam is :-

1) M = (WL/2)
2) M = (WL/8)
3) M = (WL/4)
4) M = (WL/12)

Ques # :14

The variation of the bending moment in the segment of a beam where the load is uniformly distributed is :-

1) Zero
2) Linear
3) Parabolic
4) Cubic

Ques # :15

The shear stress on a beam section is maximum :-

1) At the centroid of the section
2) On the extreme free surface fibres
3) At the free edges
4) At the neutral axis but not at the centroid of the section

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Ques # :16

The maximum tensile stress in a cantilever beam with concentrated load acting downwards on the span is caused at :-
1) Top fibre at mid span
2) Bottom fibre at mid span
3) Bottom fibre at support
4) Top fibre at support

Ques # :17

The modular of elasticity of concrete (E_c) can be assumed as

1) $2000\sqrt{fc_k}$
2) $3000\sqrt{fc_k}$
3) $4000\sqrt{fc_k}$
4) $5000\sqrt{fc_k}$

Ques # :18

The point of contraflexure is a point where :-
1) shear force changes sign
2) bending moment changes sign

3) shear force is maximum
4) bending moment is maximum

Ques # :19

The radius of Mohr's circle gives the value of :-
1) minimum normal stress
2) minimum shear stress
3) maximum normal stress
4) maximum shear stress

Ques # :20

Maximum deflection in a simply supported beam with a central point load is given by :-
1) $5\ WL^3/34EI$
2) $WL^3/3EI$
3) $WL^3/48EI$
4) $WL^3/8EI$

Ques # :21

The minimum longitudinal reinforcement in a column is provided as a percentage of gross-sectional area of the column . This percentage is :-
1) 0.6
2) 0.8
3) 1.0
4) None of These

Ques # :22

The diameter of lateral ties in a column is taken as :-

1) 1/4 diameter of the largest longitudinal bar
2) 6 mm
3) Greater of 1/4 diameter of the largest longitudinal bar or 6mm
4) None of These

Ques # :23

When width b, effective depth d, overall depth D, the maximum area of reinforcement in RCC beam shall not exceed :-

1) 0.04bd
2) 0.04bD
3) 0.05bd
4) 0.05bD

Ques # :24

For a short column , the ratio of effective length of the column to its least lateral dimension should not exceed :-

1) 11
2) 12
3) 15
4) 18

Ques # :25

Concrete in sea water shall be at least ..... grade in case of reinforced concete.

1) M20
2) M25
3) M30
4) M40

Ques # :26

A beam shall be deemed to be a deep beam when the ratio of effective span to overall depth is less than ..... for a continuous beam.

1) 2.5
2) 3
3) 3.5
4) 4

Ques # :27

In riveted construction , the minimum width of lacing bars shall be ..... times the nominal dia of the end rivet.

1) 2
2) 2.5
3) 3
4) 3.5

Ques # :28

Target strength for the mix proportioning (fck) is given by :

1) $f_{ck} - 1.65s$
2) $f_{ck} + 1.65s$
3) $f_{ck} - 2.65s$
4) $f_{ck} - 3.65s$

Ques # :29

The pH value of water for construction should be less than :-

1) 7
2) 8
3) 6
4) 9

Ques # :30

Number of phases in soil mass is :-

1) 1
2) 2
3) 3
4) 4

Ques # :31

A soil has a bulk density of 22 kN/mm² water content 10 %. The dry density of soil is :-

1) 18.6 kN/mm²
2) 20 kN/mm²
3) 22 kN/mm²
4) 23.2 kN/mm²

Ques # :32

According to IS classification , the range of silt size particle :-

1) 4.75 mm to 2.00 mm
2) 2.00 mm to 0.425 mm

3) 0.425 mm to 0.075 mm
4) 0.075 mm to 0.002 mm

Ques # :33

Sieving is not practicable for grain size smaller than about :-
1) 0.075 mm
2) 0.095 mm
3) 0.15 mm
4) 0.2 mm

Ques # :34

Which of the following is practically impermeable ?
1) Gravel
2) Sand mixture
3) Coarse sand
4) Clay

Ques # :35

A soil has a liquid limit of 40 % & plasticity index of 20 %. The plastic limit of the soil will be :-
1) 20 %
2) 30 %
3) 40 %
4) 60 %

Ques # :36

An ideal fluid is :-

1) One which obeys Newton's law of viscosity
2) Frictionless and incompressible
3) Very Viscous
4) Frictionless and Compressible

Ques # :37

Surface tension of water

1) Increase with decrease in temperature
2) Decrease with decrease in temperature
3) Is independent of temperature
4) None of these

Ques # :38

For a fully submerged body of homogeneous composition, the centre of buoyancy always

1) Coincides with the centre of gravity
2) Coincides with the centroid of the volume of fluid displaced
3) Remains above the centre of gravity
4) Remains below the centre of gravity

Ques # :39

Which of the following is used to measure the discharge ?

1) Current Meter
2) Venturimeter
3) Pitot tube
4) Hotwire anemometer

Ques # :40

The major loss of energy in long pipes is due to

1) Sudden enlargement
2) Sudden contraction
3) Gradual contraction or enlargement
4) Friction

Ques # :41

Which notch is preferable for low flow rates

1) rectangular
2) triangular
3) Both Rectangular and Triangular
4) None of these

Ques # :42

The relation between duty D in hectares/cumec, depth of water Δ in metres and base period B in days is given by

1) $\Delta = 1.98\ B/D$
2) $\Delta = 8.64\ B/D$
3) $\Delta = 5.68\ B/D$
4) $\Delta = 8.64\ D/B$

Ques # :43

Hydrograph is the graphical representation of

1) Discharge and time
2) Rainfall and time
3) Ground water flow and time
4) None of these

Ques # :44

The runoff increase with
1) Increase in intensity of rain
2) Increase in infiltration capacity
3) Increase in permeablity of soil
4) All of these

Ques # :45

An artesian aquifer is the one where
1) Water surface under the ground is at atmospheric pressure
2) Water is under pressure between two impervious strata
3) Water table serves as upper surface of zone of saturation
4) None of these

Ques # :46

In comparison to gravity dams, earthen dams
1) Are costlier
2) Are less susceptible to failure
3) Require sound rock foundations
4) require less skilled labour

Ques # :47

The maximum application rate by sprinklers is limited by

1) the infiltration capacity of the soil
2) the prevailing wind velocity
3) the quantity of water available
4) sprinkler irrigation

Ques # :48

Which of the following methods of irrigation do not use open ditches for water delivery

1) sub-irrigation
2) trickle irrigation
3) furrow irrigation
4) check irrigation

Ques # :49

The alum when added as a coagulant in water

1) Does not require alkalinity in water for flocculation
2) Does not affect pH value of water
3) Increase pH value of water
4) Decrease pH value of water

Ques # :50

MPN index is a measure of which one of the following

1) B.O.D.
2) Hardness
3) D.O.
4) Coliform Bacteria

Ques # :51

In a sedimentation tank, sedimentation depends on

1) Depth of tank
2) Surface area of tank
3) Both depth and surface area of tank
4) None of these

Ques # :52

The compounds of chlorine commonly used for disinfection are

1) Chloromines
2) Bleaching powder
3) Both chloromines and bleaching powder
4) None of these

Ques # :53

The type of valve which allows water to flow in one direction but prevents its flow in the reverse direction is

1) Reflux valve
2) Sluice valve
3) Air relief valve
4) Pressure relief valve

Ques # :54

Which of the following sewers is preferred for combined system of sewage ?

1) Circular sewer

2) Egg shaped sewer
3) Rectangular sewer
4) None of these

Ques # :55

Distance between the centres of two adjacent fastners in a line, lying in the direction of stress in tension members should be :
1) < 16 t or 200 mm whichever is less
2) < 32 t or 300 mm whichever is less
3) > 16 t or 200 mm whichever is more
4) > 32 t or 300 mm whichever is more

Ques # :56

The water of zero hardness can be achieved by
1) lime process
2) lime soda process
3) zeolite process
4) None of these

Ques # :57

The most common coagulant is
1) magnesium sulphate
2) alum
3) chlorine
4) bleaching powder

Ques # :58

The stopping sight distance depends upon

1) Total reaction time of driver
2) Speed of vehicle
3) Efficiency of brakes
4) All of these

Ques # :59

The shoulder provided along the road edge should be

1) Rougher than the traffic lanes
2) Smoother than the traffic lanes
3) Of same colour as that of the pavement
4) Of very low load bearing capacity

Ques # :60

Width of carriage way for a single lane is recommended to be

1) 7.5 m
2) 7.0 m
3) 3.75 m
4) 5.5 m

Ques # :61

The most suitable equipment for compacting clayey soils is a

1) smooth wheeled roller
2) pneumatic tyred roller
3) sheep foot roller
4) vibrator

Ques # :62

The shape of the camber, best suited for cement concrete pavements, is

1) straight line
2) parabolic
3) elliptical
4) combination of straight and parabolic

Ques # :63

Deep beams are designed for

1) shear force only
2) bending moment only
3) Both shear force and bending moment
4) bearing

Ques # :64

Which one is the correct sequence of various operations of preparation of Brick-Earth I. Blending II. Digging III. Weathering IV. Unsoiling V. Tempering

1) IV , II , III , V, I
2) IV , II , III , I, V
3) II , IV , V , III, I
4) II , III , IV, V , I

Ques # :65

Ultrasonic Pulse Velocity Test to measure the strength of concrete is - I. used to obtain estimate of concrete strength of finished concrete elements II. used to measure strength of wet concrete III. a non-destructive test Which of the above statements are correct ?

1) I and III
2) II and III
3) I and II
4) I , II and III

Ques # :66

Normally the Mastic Asphalt is used for
1) fire proofing
2) sound insulation
3) water proofing
4) None of these

Ques # :67

Which of the following statement is correct -
1) Activity is the beginning or end of the job
2) Event is time consuming part of the work
3) Acivity is denoted by arrows and events by circles or rectangles
4) Acivity is denoted by circles or rectangles and events by arrows

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Ques # :68

Which of the following is an event ?
1) mix concrete
2) assemble parts
3) pipe line laid
4) excavate foundation

Ques # :69

The alignment of highways are generally taken along -

1) along the contour line
2) across the contour line
3) the valley line
4) the ridge line

Ques # :70

The subtense bar is used to measure -

1) Horiziontal Angle
2) Vertical Angle
3) Horizontal Distance
4) Vertical Distance

Ques # :71

While using Total Station, the vertical angle is usually measured as a zenith angle -

1) 0° vertically up, 90° horizontal and 180° vertically down
2) 0° vertically down, 90° horizontal and 180° vertically up
3) 0° horizontal, 90° vertically down and 180° vertically up
4) None of these

Ques # :72

In GPS , recievers used are -

1) mechanical clocks
2) atomic clocks
3) electronic clocks
4) quartz clocks

Ques # :73

What is the correct order of the following for an engineering work - I. e-Tender II. Earnest Money III. Work Order IV. Security Deposit

1) I , III , II , IV
2) I , II , IV , III
3) I , II , III , IV
4) II , III , I , IV

Ques # :74

Consolidation time of a soil sample -

1) Increases with a decrease in permeablity
2) Increases with an increase in permeablity
3) Increases with a decrease in unit weight of water
4) Increases with a decrease in compressibility

Ques # :75

If ϕ' be the angle of shearing resistance, the angle of the failure plane with the major principal plane is equal to

1) $45° + \varphi' / 2$
2) $45° - \varphi' / 2$
3) $45° + \varphi'$
4) $45° - \varphi'$

Ques # :76

The collapsible soil is associated with -

1) loess
2) laterite soils
3) black cotton soil
4) dune sands

Ques # :77

If the coefficient of passive earth pressure is 4, then what will be the value of active earth pressure ?

1) 1/4
2) 1/16
3) 16
4) 4

Ques # :78

If water table is encountered in the standard pit while conducting plate load test :-

1) The pit is considered unsafe
2) The load test should be abandoned
3) The bearing capacity of soil cannot be determined in this condition
4) Test should be conducted with complete dewatering continuously throughout the test duration

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Ques # :79

Multi U-tube manometers with different fluids are used to measure :-

1) very low pressure
2) low pressure
3) high pressure
4) medium pressure

Ques # :80

Conversion of dynamic velocity head into static pressure head in a centrifugal pump is result of :-

1) difference in pressure between suction and delivery ends
2) stuffing box
3) increasing area of flow between adjacent vanes from inlet to outlet
4) radial thrust in pumps

Ques # :81

From the surface of reservoir, evaporation may be minimised by sprinkling :-

1) Hydrochloric acid
2) Acetyl alcohal
3) Methane
4) Spirit

Ques # :82

The total number of independent equations that form the Lacey's regime theory is :-

1) 6
2) 4
3) 3
4) 2

Ques # :83

A check dam is :-

1) River training structure
2) Water Storage structure
3) Flood control structure

4) Soil conservation structure

Ques # :84

Which one of the following is the purpose of providing the downstream sheet pile in a barrage :-

1) To control failure due to scour
2) To stop failure due to sliding
3) To stop failure due to uplift pressure
4) To control failure due to piping by high value of exit gradient

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Ques # :85

Which one the following Acts/Rules has a provision for ' No right to appeal' ?

1) The Hazardous Waste (Management and Handling) Rules , 1989
2) Environment (Protection) Act, 1986
3) Environment (Protection) Rules, 1992
4) Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

Ques # :86

The trap used for a water closet is called :-

1) P-trap
2) Gully trap
3) Anti-siphon trap
4) None of these

Ques # :87

The maximum safe permissible limit of sulphates in domestic water supply is :-

1) 600mg/L
2) 500mg/L
3) 200mg/L
4) 300mg/L

Ques # :88

The cleaning of slow sand filter is done by :-
1) scraping off top layers of sand and admitting water
2) passing air through the filter
3) passing a solution of air and lime through the filter
4) reversing the direction of flow of water

Ques # :89

The ultimate BOD value of a waste :-
1) remains the same at all temperatures
2) decreases with temperature
3) increases with temperature
4) doubles with every 10° C rise in temperature

Ques # :90

Which one of the following types of samples in relatively employed for the design of wastewater treatment plant :-
1) Composite sample
2) Grab sample
3) Integrated sample
4) None of these

Ques # :91

Traffic capacity is the :-

1) Number of vehicles occupying a unit length of roadway at a given instant expressed as vehicles/km
2) Ability of roadway to accommodate traffic volume in terms of vehicles/hr
3) Maximum attainable speed of vehicles
4) Capacity of lane to accommodate the vehicles widthwise (across the road)

Ques # :92

What is the standard for testing of road macadam in Aggregate Impact Test :-

1) 18 kg wt, 30 cm drop, 20 blows
2) 18 kg wt, 35 cm drop, 15 blows
3) 14 kg wt, 35 cm drop, 20 blows
4) 14 kg wt, 38 cm drop, 15 blows

Ques # :93

In Los Angeles Abrasion Test on aggregates , if the speed of the drum is increased to 50 rpm, then the abrasion value will :-

1) be unpredictable
2) remain unchanged
3) decrease
4) increase

Ques # :94

The stress at which a material fractures under large number of reversals of stress is called :-

1) creep
2) ultimate strength
3) endurance limit
4) residual stress

Ques # :95

The ratio of maximum deflection of a simply supported beam with a central load W and of a cantilever of same length and with a load W at its free end :-

1) 1/8
2) 1/10
3) 1/12
4) 1/16

Ques # :96

The slenderness ratio of a long column is :-

1) radius of gyration divided by area of cross section
2) length of column divided by least radius of gyration
3) area of cross section divided by least radius of gyration
4) area of cross section divided by radius of gyration

Ques # :97

As the percentage of steel increases :-

1) depth of neutral axis increases
2) depth of neutral axis decreases
3) lever arm decreases
4) lever arm increases

Ques # :98

The diameter of longitudinal bars of a column should never be less than :-

1) 8 mm
2) 10 mm
3) 12 mm
4) 16 mm

Ques # :99

The ultimate strength of the steel used for prestressing is nearly :-

1) $500\ N/mm^2$
2) $1500\ N/mm^2$
3) $250\ N/mm^2$
4) $415\ N/mm^2$

Ques # :100

The height at which wind force acts on a moving vehicle on a bridge deck is :-

1) 1.75 m
2) 1.25 m
3) 1.5 m
4) 2.0 m
