

परीक्षेचे नांव : सहायक प्राध्यापक, स्थापत्य अभियांत्रिकी,
अस्वायत्त शासकीय अभियांत्रिकी महाविद्यालय, महाराष्ट्र अभियांत्रिकी महाविद्यालयीन शिक्षक सेवा, गट -अ,
चाळणी परीक्षा-2014

परीक्षेचा दिनांक : 27 जुलै, 2014

विषय : स्थापत्य अभियांत्रिकी,

महाराष्ट्र लोकसेवा आयोगामार्फत सहायक प्राध्यापक, स्थापत्य अभियांत्रिकी, अस्वायत्त शासकीय अभियांत्रिकी महाविद्यालय, महाराष्ट्र अभियांत्रिकी महाविद्यालयीन शिक्षक सेवा, गट -अ, चाळणी परीक्षा-२०१४ या परीक्षेच्या प्रश्नपत्रिकेची उत्तरतालिका उमेदवारांच्या माहितीसाठी संकेतस्थळावर प्रसिध्द करण्यात आली आहे. सदर उत्तरतालिकेतील प्रश्न-उत्तरांसंबंधी उमेदवारांना निवेदन करावयाचे असल्यास त्यांनी अधिप्रमाणीत स्पष्टीकरण / संदर्भ देऊन तसेच विषय, परीक्षेचे नाव, प्रश्नसंच, प्रश्नक्रमांक यांच्या उल्लेखासह आपले लेखी निवेदन उपसचिव (गोपनीय), महाराष्ट्र लोकसेवा आयोग, बँक ऑफ इंडिया बिल्डिंग, ३ रा मजला, हुतात्मा चौक, मुंबई ४०० ००१ या पत्त्यावर टपालाने पाठवावे. यासंदर्भात दि. ०८ ऑगस्ट, २०१४ पर्यंत आयोगाकडे प्राप्त झालेल्या निवेदनांचीच दखल घेतली जाईल. तद्नंतर आलेली निवेदने विचारात घेतली जाणार नाहीत, याची कृपया नोंद घ्यावी

उत्तरतालिका - KEY

MPSC

MPSC 27th July 2014 Shift 1

Notations :

1. Options shown in green color and with ✓ icon are correct.
2. Options shown in red color and with ✗ icon are incorrect.

Question Paper Name:	Assistant Professor Civil ACTUAL
Subject Name:	Assistant Professor Civil
Duration:	60

Group 1	
Group Maximum Duration :	0
Group Minimum Duration :	60
Revisit allowed for view? :	No
Revisit allowed for edit? :	No

Assistant Professor Civil	
Mandatory or Optional:	Mandatory

Question Number : 1 Question Type : MCQ

Correct : 2 Wrong : 0

In dugout well the discharge should be -

Options :

1. ✗ $10\text{m}^3/\text{hrs}$
2. ✗ $15\text{m}^3/\text{hrs}$
3. ✓ $20\text{m}^3/\text{hrs}$
4. ✗ $50\text{m}^3/\text{hrs}$

Question Number : 2 Question Type : MCQ

Correct : 2 Wrong : 0

The method by which the increase in population can be exactly predicted is known as :-

Options :

1. ✘ Arithmetical increase method
2. ✔ Geometrical increase method
3. ✘ Incremental increase method
4. ✘ Graphic method

Question Number : 3 Question Type : MCQ

Correct : 2 Wrong : 0

The permissible limit of turbidity for domestic water supply is:-

Options :

1. ✘ 2 to 5 ppm
2. ✔ 5 to 10 ppm
3. ✘ 10 to 15 ppm
4. ✘ 15 to 20 ppm

Question Number : 4 Question Type : MCQ

Correct : 2 Wrong : 0

The first stage of water treatment is:-

Options :

1. ✔ Mixing and coagulation
2. ✘ Sedimentation
3. ✘ Filtration
4. ✘ Disinfection

Question Number : 5 Question Type : MCQ

Correct : 2 Wrong : 0

In India the water distribution system which is not commonly used is:-

Options :

1. ✘ Ring system
2. ✔ Radial system
3. ✘ Dead end system
4. ✘ Grid iron system

Question Number : 6 Question Type : MCQ

Correct : 2 Wrong : 0

In combined system of sewerage the following flows together -

Options :

1. ✘ Domestic waste and Industrial waste
2. ✘ Garbage and Rain water
3. ✘ Industrial waste and Rain water
4. ✔ Dry weather flow and Rain water

Question Number : 7 Question Type : MCQ

Correct : 2 Wrong : 0

The opening left on sewage drain line is known as:-

Options :

1. ✘ Lamp hole
2. ✔ Man hole
3. ✘ Inspection chamber
4. ✘ Street inlets

Question Number : 8 Question Type : MCQ

Correct : 2 Wrong : 0

The pathogens can be killed by the following treatment -

Options :

1. ✔ Chlorination
2. ✘ Oxidation
3. ✘ Nitrification
4. ✘ Ozone

Question Number : 9 Question Type : MCQ

Correct : 2 Wrong : 0

Simple trickling filter removes B.O.D upto -

Options :

1. ✘ 70%
2. ✔ 90%
3. ✘ 95%

4. ✘ 100%

Question Number : 10 Question Type : MCQ

Correct : 2 Wrong : 0

The presence of one or more contaminants in the atmosphere which are injurious to human, plant or animal life is termed as:

Options :

1. ✘ Water pollution
2. ✘ Marine pollution
3. ✔ Air pollution
4. ✘ Sound pollution

Question Number : 11 Question Type : MCQ

Correct : 2 Wrong : 0

Which one is not the man made sources of air pollution

Options :

1. ✘ Combustion of fuels
2. ✘ Agricultural activities
3. ✔ Radioactive materials
4. ✘ Rapid industrialization

Question Number : 12 Question Type : MCQ

Correct : 2 Wrong : 0

Which pollutants react with the hemoglobin in the blood and reduce its oxygen carrying capacity-

Options :

1. ✘ SO_2, NO_x
2. ✘ $\text{H}_2\text{S}, \text{NO}_2$
3. ✘ Polycyclic organic compounds
4. ✔ CO, NO

Question Number : 13 Question Type : MCQ

Correct : 2 Wrong : 0

The worst tragic accident of air pollution took place in Bhopal, Madhya Pradesh as Gas disaster which took a toll over 10,000 human lives. This accident was on –

Options :

1. ✘ 12-02-1984
2. ✘ 09-03-1984
3. ✘ 03-09-1984
4. ✔ 03-12-1984

Question Number : 14 Question Type : MCQ

Correct : 2 Wrong : 0

Any unwanted electromagnetic signal that produces a displeasing effect and which interferes with human communication, comfort and health is known as-

Options :

1. ✘ Water pollution
2. ✘ Air pollution
3. ✘ Marine pollution
4. ✔ Noise pollution

Question Number : 15 Question Type : MCQ

Correct : 2 Wrong : 0

Which one is not the physical effect of noise -

Options :

1. ✘ Auditory effects
2. ✔ Cardio vascular system effect
3. ✘ Speech interference
4. ✘ Effects on working efficiency

Question Number : 16 Question Type : MCQ

Correct : 2 Wrong : 0

The noise level of normal conversation is taken as-

Options :

1. ✔ 40 (db)
2. ✘ 50 (db)
3. ✘ 60 (db)

4. ✘ 70 (db)

Question Number : 17 Question Type : MCQ

Correct : 2 Wrong : 0

Planting green trees along roads, hospital, educational institute gives-

Options :

1. ✘ More noise
2. ✔ Reduce noise to considerable extent
3. ✘ Shadow but not reduce noise
4. ✘ Checks air pollution but not noise pollution

Question Number : 18 Question Type : MCQ

Correct : 2 Wrong : 0

When the brakes are applied and the vehicle moves without rotation of wheels is known as

Options :

1. ✘ Slipping
2. ✔ Skidding
3. ✘ Moving
4. ✘ Travelling

Question Number : 19 Question Type : MCQ

Correct : 2 Wrong : 0

According to I.R.C., the value of camber in cement concrete roads should be:-

Options :

1. ✘ 1 in 20 to 24
2. ✘ 1 in 30 to 48
3. ✘ 1 in 48 to 60
4. ✔ 1 in 60 to 72

Question Number : 20 Question Type : MCQ

Correct : 2 Wrong : 0

According to I.R.C., the minimum width of a carriage way for two way road should be:-

Options :

1. ✓ 7.5 m
2. ✗ 10 m
3. ✗ 12.5 m
4. ✗ 15 m

Question Number : 21 Question Type : MCQ

Correct : 2 Wrong : 0

How many meters ahead, the sign indicator disc for speed limit on National and State highway should be provided-

Options :

1. ✗ 80 m
2. ✗ 60 m
3. ✓ 120 m
4. ✗ 100 m

Question Number : 22 Question Type : MCQ

Correct : 2 Wrong : 0

The mixture of National pyrogenous hydrocarbon and its non-metallic derivatives which dissolves in carbon disulphide is called as:-

Options :

1. ✗ Petroleum
2. ✗ Cut back emulsion
3. ✓ Bitumen
4. ✗ Asphalt

Question Number : 23 Question Type : MCQ

Correct : 2 Wrong : 0

According to I.R.C., for providing pre-mixed bitumen carpet, the grade of bitumen should be:-

Options :

1. ✗ 180/200
2. ✗ 100/120
3. ✓ 80/100

4. ✘ 60/80

Question Number : 24 Question Type : MCQ

Correct : 2 Wrong : 0

As per I.R.C., the critical slope on hill roads should not be more than

Options :

1. ✘ 1 in 12

2. ✔ 1 in 15

3. ✘ 1 in 20

4. ✘ 1 in 30

Question Number : 25 Question Type : MCQ

Correct : 2 Wrong : 0

The drain made on upper side of hills slope is known as:-

Options :

1. ✘ Side drain

2. ✔ Catch water drain

3. ✘ Under drain

4. ✘ Cross drain

Question Number : 26 Question Type : MCQ

Correct : 2 Wrong : 0

On road sides the plantation of trees and taking their care till its self survival is known as

Options :

1. ✘ Pruning

2. ✘ Lopping

3. ✘ Landscape

4. ✔ Arboriculture

Question Number : 27 Question Type : MCQ

Correct : 2 Wrong : 0

Holes of 10cm to 12cm diameter made in abutment wall to drain out seepage water are known as:-

Options :

1. ✘ Scuppers
2. ✘ Saucer drain
3. ✔ Weep holes
4. ✘ Honey combing

Question Number : 28 Question Type : MCQ

Correct : 2 Wrong : 0

As per Indian standard, the length of one link of a 30m long chain, will be-

Options :

1. ✘ 10 cm
2. ✔ 20 cm
3. ✘ 30 cm
4. ✘ 40 cm

Question Number : 29 Question Type : MCQ

Correct : 2 Wrong : 0

Due to bad ranging the error in length will be termed as:-

Options :

1. ✔ Cumulative error
2. ✘ Compensating error
3. ✘ Neutral error
4. ✘ Some time cumulative and some time compensative error

Question Number : 30 Question Type : MCQ

Correct : 2 Wrong : 0

Optical square works on the principle of -

Options :

1. ✘ Reflection
2. ✘ Refraction
3. ✘ Double refraction
4. ✔ Double reflection

Question Number : 31 Question Type : MCQ

Correct : 2 Wrong : 0

In a closed polygon if the numbers of sides are 'n' then the sum of all the exterior angles(in degree) will be given by -

Options :

1. ✘ $(n+2) \times 90$
2. ✘ $(2n+4) \times 90$
3. ✘ $(2n-4) \times 90$
4. ✔ $(4n-2) \times 90$

Question Number : 32 Question Type : MCQ

Correct : 2 Wrong : 0

An imaginary line joining the point of zero declination on the earth surface is known as -

Options :

1. ✘ Magnetic declination line
2. ✔ Agonic line
3. ✘ Isoclinic line
4. ✘ Isogonic line

Question Number : 33 Question Type : MCQ

Correct : 2 Wrong : 0

For exact centering of plane table, the following instrument is used -

Options :

1. ✘ Spirit level
2. ✔ Plumbing fork
3. ✘ Alidade
4. ✘ Ranging rod

Question Number : 34 Question Type : MCQ

Correct : 2 Wrong : 0

In a theodolite the telescope is rotated by 180° in its vertical plane along horizontal axis is known as:-

Options :

1. ✘ Back sighting
2. ✘ Inverting the telescope
3. ✔ Transiting
4. ✘ Swinging of telescope

Question Number : 35 Question Type : MCQ

Correct : 2 Wrong : 0

Which one of the following instrument will give the horizontal as well as vertical angles very accurately?

Options :

1. ✘ Tangent clinometer
2. ✔ Theodolite
3. ✘ Prismatic compass
4. ✘ Surveyer's compass

Question Number : 36 Question Type : MCQ

Correct : 2 Wrong : 0

The instrument used to reproduce, enlarge or reduce the given map is termed as:-

Options :

1. ✘ Planimeter
2. ✘ Box- sextent
3. ✔ Pentagraph
4. ✘ Cardiograph

Question Number : 37 Question Type : MCQ

Correct : 2 Wrong : 0

When the products of rock weathering are not transported but remain at the place of formation, the soil is called -

Options :

1. ✘ Alluvial soil
2. ✘ Talus

3. ✓ Residual soil

4. ✗ Aeolian soil

Question Number : 38 Question Type : MCQ

Correct : 2 Wrong : 0

The most accurate method for the determination of water content in the laboratory is:-

Options :

1. ✗ Sand bath method

2. ✓ Oven drying method

3. ✗ Pycnometer method

4. ✗ Calcium carbide method

Question Number : 39 Question Type : MCQ

Correct : 2 Wrong : 0

The particle size distribution curve with a hump is obtained for a:-

Options :

1. ✗ Uniform soil

2. ✗ Well - graded soil

3. ✓ Gap- graded soil

4. ✗ Poorly- graded soil

Question Number : 40 Question Type : MCQ

Correct : 2 Wrong : 0

A stiff clay has a consistency index of:-

Options :

1. ✗ Less than 50

2. ✗ 50 to 75

3. ✓ 75 to 100

4. ✗ Greater than 100

Question Number : 41 Question Type : MCQ

Correct : 2 Wrong : 0

According to I.S. Classification system, the soils can be classified into:-

Options :

1. ✓ 18 groups
2. ✗ 15 groups
3. ✗ 7 groups
4. ✗ 3 groups

Question Number : 42 Question Type : MCQ

Correct : 2 Wrong : 0

The permeability of soil varies:-

Options :

1. ✗ Inversely as square of grain size
2. ✗ As grain size
3. ✓ As Square of grain size
4. ✗ Inversely as void ratio

Question Number : 43 Question Type : MCQ

Correct : 2 Wrong : 0

The coefficient of permeability of clay is generally

Options :

1. ✗ 10^{-2} to 10^{-4} mm/s
2. ✗ 10^{-4} to 10^{-5} mm/s
3. ✓ 10^{-5} to 10^{-8} mm/s
4. ✗ Less than 10^{-8} mm/s

Question Number : 44 Question Type : MCQ

Correct : 2 Wrong : 0

A flow net can be used to determine -

Options :

1. ✗ Seepage, coefficient of permeability and uplift pressure
2. ✗ Seepage, coefficient of permeability and exit gradient
3. ✓ Seepage, exit gradient and uplift pressure

4. ✘ Seepage and exit gradient only

Question Number : 45 Question Type : MCQ

Correct : 2 Wrong : 0

The coefficient of compressibility is the ratio of-

Options :

1. ✔ Change in Void ratio to change in effective stress
2. ✘ Volumetric strain to change in effective stress
3. ✘ Change in thickness to change in effective stress
4. ✘ Stress to strain

Question Number : 46 Question Type : MCQ

Correct : 2 Wrong : 0

With an increase in the liquid limit, compression index –

Options :

1. ✘ Decreases
2. ✔ Increases
3. ✘ Remain constant
4. ✘ May increase or decrease

Question Number : 47 Question Type : MCQ

Correct : 2 Wrong : 0

Coulomb's equation for shear strength can be represented as -

Options :

1. ✘ $C = S + \sigma \cdot \tan \phi$
2. ✔ $C = S - \sigma \cdot \tan \phi$
3. ✘ $S = \sigma + C \tan \phi$
4. ✘ $S = C - \sigma \cdot \tan \phi$

Question Number : 48 Question Type : MCQ

Correct : 2 Wrong : 0

Vibratory rollers are best suited for compacting -

Options :

1. ✓ Coarse sand and gravels
2. ✗ Silts
3. ✗ Clays
4. ✗ Organic soils

Question Number : 49 Question Type : MCQ

Correct : 2 Wrong : 0

For a standard compaction test, the mass of hammer and the drop of hammer are as follows:-

Options :

1. ✗ 2.6 kg and 450 mm
2. ✓ 2.6 kg and 310 mm
3. ✗ 4.8 kg and 310 mm
4. ✗ 4.89 kg and 450 mm

Question Number : 50 Question Type : MCQ

Correct : 2 Wrong : 0

A shallow foundation is usually defined as a foundation which has-

Options :

1. ✗ Depth less than 0.6 m
2. ✓ Depth less than its width
3. ✗ Depth less than 1.0 m
4. ✗ Depth less than 1.2 m

Question Number : 51 Question Type : MCQ

Correct : 2 Wrong : 0

The bearing capacity of soil supporting a footing of size $3\text{m} \times 3\text{m}$, will not be affected by the presence of water table located at a depth below the base of footing of-

Options :

1. ✗ 1 m
2. ✗ 1.5 m

3. ✓ 3.0 m

4. ✗ 6.0 m

Question Number : 52 Question Type : MCQ

Correct : 2 Wrong : 0

For the design of a strap footing, the following assumption is not made-

Options :

1. ✗ The strap is not subjected to any direct soil pressure

2. ✗ The interior footing is centrally loaded

3. ✓ The soil pressure varies linearly

4. ✗ The strap is perfectly rigid

Question Number : 53 Question Type : MCQ

Correct : 2 Wrong : 0

The load carrying capacity of a bored pile in sand is how many times that of a driven pile-

Options :

1. ✓ 1/2 to 2/3

2. ✗ 2/3 to 3/4

3. ✗ 3/4 to 1.25

4. ✗ more than 1.25

Question Number : 54 Question Type : MCQ

Correct : 2 Wrong : 0

The most commonly used shape of a well foundation is -

Options :

1. ✗ Double – D well

2. ✓ Circular well

3. ✗ Double octagonal well

4. ✗ Rectangular well

Question Number : 55 Question Type : MCQ

Correct : 2 Wrong : 0

The flow in a 30cm diameter pipe is 100m/sec. What will be the flow if the diameter of pipe reduced to 15 cm -

Options :

1. ✘ 50 m/sec.
2. ✘ 100 m/sec.
3. ✘ 200 m/sec.
4. ✔ 400 m/sec.

Question Number : 56 Question Type : MCQ

Correct : 2 Wrong : 0

The Notch is fitted to a tank or a channel to measure -

Options :

1. ✘ Velocity
2. ✘ Pressure
3. ✔ Discharge
4. ✘ Static energy

Question Number : 57 Question Type : MCQ

Correct : 2 Wrong : 0

For maximum flow velocity in a circular channel the depth of flow should be-

Options :

1. ✘ Equal to the diameter of channel
2. ✘ 0.5 times the diameter of channel
3. ✔ 0.81 time the diameter of channel
4. ✘ 1.5 times the diameter of channel

Question Number : 58 Question Type : MCQ

Correct : 2 Wrong : 0

For any crop the flow of water in days and the ratio of fixed days to irrigate that crop is known as-

Options :

1. ✘ Capacity factor
2. ✘ Outlet factor

3. ✘ Full supply coefficient

4. ✔ Time factor

Question Number : 59 Question Type : MCQ

Correct : 2 Wrong : 0

The core period for "Rabi" crop is -

Options :

1. ✘ 2 weeks

2. ✘ 3 weeks

3. ✔ 4 weeks

4. ✘ 5 weeks

Question Number : 60 Question Type : MCQ

Correct : 2 Wrong : 0

The crop which does not need any irrigation is termed as:-

Options :

1. ✔ Dry crop

2. ✘ Wet crop

3. ✘ Kharif crop

4. ✘ Rabi crop

Question Number : 61 Question Type : MCQ

Correct : 2 Wrong : 0

The economical section of canal during construction is termed when there is:-

Options :

1. ✘ Minimum excavation

2. ✘ Minimum filling

3. ✔ Excavation and filling both are of same quantity

4. ✘ Cutting is less than filling

Question Number : 62 Question Type : MCQ

Correct : 2 Wrong : 0

For the manufacture of Portland cement the proportion of raw materials used are-

Options :

1. ✘ Lime 22%, Silica 63%, others 15%
2. ✔ Lime 63%, Silica 22%, others 15%
3. ✘ Silica 40%, Lime 40%, others 20%
4. ✘ Silica 70%, Lime 20%, others 10%

Question Number : 63 Question Type : MCQ

Correct : 2 Wrong : 0

Initial setting time of Ordinary Portland cement should not be less than-

Options :

1. ✘ 10 Min
2. ✘ 20 Min
3. ✘ 25 Min
4. ✔ 30 Min

Question Number : 64 Question Type : MCQ

Correct : 2 Wrong : 0

Queen closer is placed -

Options :

1. ✘ In header course at any place
2. ✘ In stretcher course at any place
3. ✔ In header course next to first brick
4. ✘ In stretcher course next to first brick

Question Number : 65 Question Type : MCQ

Correct : 2 Wrong : 0

Dado is usually provided in -

Options :

1. ✘ Dinning halls
2. ✔ Bathroom

3. ✘ Living room

4. ✘ Verandah

Question Number : 66 Question Type : MCQ

Correct : 2 Wrong : 0

Studs are known as-

Options :

1. ✘ Horizontal wooden member

2. ✔ Vertical wooden member

3. ✘ Lower horizontal wooden member

4. ✘ Intermediate wooden member

Question Number : 67 Question Type : MCQ

Correct : 2 Wrong : 0

The platform at the end of a series of steps is known as -

Options :

1. ✘ Relief

2. ✘ Stop

3. ✘ Tread

4. ✔ Landing

Question Number : 68 Question Type : MCQ

Correct : 2 Wrong : 0

A temporary structure having platform to enable masons to work at different stages of a building is known as -

Options :

1. ✘ Dead shore

2. ✘ Raking shore

3. ✔ Scaffolding

4. ✘ Under pinning

Question Number : 69 Question Type : MCQ

Correct : 2 Wrong : 0

Minimum compressive strength of building bricks is -

Options :

1. ✘ 25 kg/cm²
2. ✘ 30 kg/cm²
3. ✔ 35 kg/cm²
4. ✘ 40 kg/cm²

Question Number : 70 Question Type : MCQ

Correct : 2 Wrong : 0

Maximum water absorption by weight of class I bricks after immersion in cold water for 24 hours is:

Options :

1. ✘ 10%
2. ✘ 15%
3. ✔ 20%
4. ✘ 25%

Question Number : 71 Question Type : MCQ

Correct : 2 Wrong : 0

The major ingredient of Portland cement is -

Options :

1. ✘ Silica
2. ✔ Lime
3. ✘ Alumina
4. ✘ Iron oxide

Question Number : 72 Question Type : MCQ

Correct : 2 Wrong : 0

The ratio of cement, sand and aggregates in M20 concrete is-

Options :

1. ✘ 1 : 2 : 4
2. ✘ 1 : 1 : 2

3. ✓ 1 : 1.5 : 3

4. ✗ 1 : 2 : 3

Question Number : 73 Question Type : MCQ

Correct : 2 Wrong : 0

Sand stone is an example of -

Options :

1. ✗ Igneous rock

2. ✗ Metamorphic rock

3. ✓ Sedimentary

4. ✗ Volcanic

Question Number : 74 Question Type : MCQ

Correct : 2 Wrong : 0

Class II timbers have average life (in months) of -

Options :

1. ✗ 12 – 29

2. ✗ 30 – 49

3. ✓ 60 – 119

4. ✗ 120 – 149

Question Number : 75 Question Type : MCQ

Correct : 2 Wrong : 0

The covering of concrete placed at the top of an external wall is known as -

Options :

1. ✗ Cornice

2. ✓ Coping

3. ✗ Frieze

4. ✗ Lintel

Question Number : 76 Question Type : MCQ

Correct : 2 Wrong : 0

The point of contraflexure in beams is where-

Options :

1. ✘ Shear force changes sign
2. ✔ Bending moment changes sign
3. ✘ Load changes sign
4. ✘ Displacement changes sign

Question Number : 77 Question Type : MCQ

Correct : 2 Wrong : 0

Relationship of shear force (F) and load intensity (w) and bending moment (M) are-

Options :

1. ✔ $\frac{dF}{dx} = w, \frac{dM}{dx} = -F$
2. ✘ $\frac{dF}{dx} = -w, \frac{dM}{dx} = -F$
3. ✘ $\frac{dF}{dx} = -w, \frac{dM}{dx} = F$
4. ✘ $\frac{dF}{dx} = w, \frac{dM}{dx} = F$

Question Number : 78 Question Type : MCQ

Correct : 2 Wrong : 0

A solid conical bar of uniformly varying diameter has diameter 'D' at one end and zero at the other end. If length of the bar is 'L', modulus of elasticity 'E' and unit weight γ , extension of the bar due to self weight is-

Options :

1. ✘ $\frac{\gamma L^2}{2E}$
2. ✘ $\frac{\gamma L^2}{4E}$

3. ✓ $\frac{\gamma L^2}{6E}$

4. ✗ $\frac{\gamma L^2}{8E}$

Question Number : 79 Question Type : MCQ

Correct : 2 Wrong : 0

Hooke's law is valid up to -

Options :

1. ✓ Limit of proportionality

2. ✗ Elastic limit

3. ✗ Upper yield point

4. ✗ Lower yield point

Question Number : 80 Question Type : MCQ

Correct : 2 Wrong : 0

For Euler's buckling theory of column; the limiting value of slenderness ratio is-
(Where f_c is the crushing strength and E is the Young's modulus)

Options :

1. ✗ $\sqrt{\frac{\pi^2 E}{4f_c}}$

2. ✗ $\sqrt{\frac{\pi^2 E}{3f_c}}$

3. ✗ $\sqrt{\frac{\pi^2 E}{2f_c}}$

4. ✓ $\sqrt{\frac{\pi^2 E}{f_c}}$

Question Number : 81 Question Type : MCQ

Correct : 2 Wrong : 0

Torsion required to produce a unit angle of twist in a unit length is called –

Options :

1. ✘ Modulus of rigidity
2. ✘ Polar moment of inertia
3. ✔ Torsional rigidity
4. ✘ Torsion constant

Question Number : 82 Question Type : MCQ

Correct : 2 Wrong : 0

Which method is used for finding the deflection of truss?

Options :

1. ✘ Euler Bernoulli method
2. ✔ Castigliano method
3. ✘ Rankine method
4. ✘ Hardy Cross method

Question Number : 83 Question Type : MCQ

Correct : 2 Wrong : 0

The final moment at end A in a beam AB due to rotation θ_A, θ_B and downward settlement Δ of support B is given by -

Options :

1. ✘ $M_{FAB} + \frac{4EI}{l^2} (\theta_A + 2\theta_B - 3\Delta/l)$
2. ✘ $M_{FAB} + \frac{4E^2}{l^2} (2\theta_A + \theta_B - 3\Delta/l)$
3. ✔ $M_{FAB} + \frac{2EI}{l^2} (2\theta_A + \theta_B - 3\Delta/l)$
4. ✘ $M_{FAB} + \frac{4EI}{l^2} (\theta_A + 2\theta_B + 4\Delta/l)$

Question Number : 84 Question Type : MCQ

Correct : 2 Wrong : 0

If the far end of the member is fixed, the stiffness of the beam with usual notation is –

Options :

1. ✘ $\frac{2EI}{l}$

2. ✘ $\frac{3EI}{l}$

3. ✔ $\frac{4EI}{l}$

4. ✘ $\frac{5EI}{l}$

Question Number : 85 Question Type : MCQ

Correct : 2 Wrong : 0

Deflection at free end of a cantilever beam of span 'l', subjected to uniformly distributed load of 'w' intensity is-

Options :

1. ✘ $\frac{wl^4}{4EI}$

2. ✘ $\frac{wl^4}{6EI}$

3. ✔ $\frac{wl^4}{8EI}$

4. ✘ $\frac{wl^4}{10EI}$

Question Number : 86 Question Type : MCQ

Correct : 2 Wrong : 0

A three hinge circular arch of span 25m and rise 5m carries a point load of 100kN at 6m from left support. The reaction at crown is –

Options :

1. ✘ 45 kN

2. ✔ 60 kN

3. ✘ 75 kN

4. ✘ 90 kN

Question Number : 87 Question Type : MCQ

Correct : 2 Wrong : 0

In limit state of serviceability, deflection calculation is done based on-

Options :

1. ✔ Service load & characteristic strength

2. ✘ Ultimate load & characteristic strength

3. ✘ Service load & design strength

4. ✘ Ultimate load & design strength

Question Number : 88 Question Type : MCQ

Correct : 2 Wrong : 0

Which is not a reason for the difference between actual and theoretical bar cut off points –

Options :

1. ✘ Unexpected shift in design moment

2. ✘ Development length requirements

3. ✔ Unexpected shift in concrete strength

4. ✘ Development of premature diagonal tension cracks

Question Number : 89 Question Type : MCQ

Correct : 2 Wrong : 0

For severe exposure, concrete grade should be –

Options :

1. ✘ M 20

2. ✘ M 25

3. ✔ M 30

4. ✘ M 35

Question Number : 90 Question Type : MCQ

Correct : 2 Wrong : 0

Which is not a type of shear reinforcement?

Options :

1. ✘ Stirrups perpendicular to beam axis
2. ✘ Stirrups inclined to the beam axis
3. ✘ Longitudinal bent up bars
4. ✔ Additional longitudinal bars

Question Number : 91 Question Type : MCQ

Correct : 2 Wrong : 0

In RCC slab, maximum diameter of main bars should not exceed –

Options :

1. ✔ One eighth of total thickness
2. ✘ One tenth of total thickness
3. ✘ One twelfth of total thickness
4. ✘ One fifteenth of total thickness

Question Number : 92 Question Type : MCQ

Correct : 2 Wrong : 0

Flexibility matrix method is also known as –

Options :

1. ✘ Displacement method
2. ✘ Equilibrium method
3. ✔ Compatibility method
4. ✘ Slope deflection method

Question Number : 93 Question Type : MCQ

Correct : 2 Wrong : 0

If the nominal diameter of the rivet is 20mm, its gross diameter will be –

Options :

1. ✘ 21 mm
2. ✔ 21.5 mm
3. ✘ 22 mm
4. ✘ 22.5 mm

Question Number : 94 Question Type : MCQ

Correct : 2 Wrong : 0

The pitch of roof truss is kept between

Options :

1. ✘ $1/3$ to $1/5$
2. ✔ $1/4$ to $1/6$
3. ✘ $1/5$ to $1/7$
4. ✘ $1/6$ to $1/8$

Question Number : 95 Question Type : MCQ

Correct : 2 Wrong : 0

Wind velocity at any station is reported at –

Options :

1. ✔ 10 m height from ground
2. ✘ 15 m height from ground
3. ✘ 20 m height from ground
4. ✘ 25 m height from ground

Question Number : 96 Question Type : MCQ

Correct : 2 Wrong : 0

Diagonal elements of a skew symmetric matrix of odd order are-

Options :

1. ✘ Purely imaginary
2. ✔ Zero
3. ✘ Unity
4. ✘ Purely real

Question Number : 97 Question Type : MCQ

Correct : 2 Wrong : 0

The eigen values of matrix [A] are 1, -1, 2 then find the eigen values of A^{-1}

Options :

1. ✔ 1, -1, $1/2$

2. ✘ -1 , -1 , 2
3. ✘ 1 , 1 , 2
4. ✘ 1 , -1, -1/2

Question Number : 98 Question Type : MCQ

Correct : 2 Wrong : 0

If $f(x) = x^2 - x - 2$, then find the maximum value of $f(x)$ in the interval $[-4, 4]$

Options :

1. ✘ 10
2. ✘ -2.25
3. ✔ 18
4. ✘ Indeterminate

Question Number : 99 Question Type : MCQ

Correct : 2 Wrong : 0

Which of the following statements are correct?

$$(i) \nabla \times \left(\frac{\nabla}{\nabla} \phi \right) = 0$$

$$(ii) \nabla \cdot \left(\frac{\nabla}{\nabla} \times \vec{F} \right) = 0$$

When $\nabla =$ del operator, $\phi =$ scalar function, $f =$ vector function

Options :

1. ✔ Both are correct
2. ✘ (i) is true (ii) is false
3. ✘ (i) is false (ii) is true
4. ✘ Both are incorrect

Question Number : 100 Question Type : MCQ

Correct : 2 Wrong : 0

The Laplace transform of ramp function is -

Options :

1. ✘ 1/S

2. ✓ $1/S^2$

3. ✗ $2/S^2$

4. ✗ $1/2S^2$