

# ESE 2020

## Paper-1

Mechanical Engineering

► **Questions & Answer Key**

1. Which one of the following is not a creative commons license which users can choose to apply when publishing their work?
- A. Attribution
  - B. Share-Alike
  - C. Copyright Infringement
  - D. No Derivative Works

**Ans. C**

2. The Ethernet designed by IEEE to compete with LAN protocols which can transmit data ten times faster at a rate of 100 Mbps is
- A. fast Ethernet
  - B. bridged Ethernet
  - C. switched Ethernet
  - D. full-duplex Ethernet

**Ans. A**

3. IEEE standard protocol which defines a wireless Personal Area Network (PAN) operable in a room is
- A. Wi-Fi
  - B. Bluetooth
  - C. Infrared
  - D. Wireless LAN

**Ans. B**

4. Which one of the following points is a private switching station that connects the national internet service provider's network and operates at a high data rate up to 600 Mbps?
- A. Locking point
  - B. Peering point
  - C. Hub point
  - D. Modem point

**Ans. B**

5. Which one of the following is the nodal department to implement public internet access program and rural internet connectivity by converting its offices as multi-service centres?
- A. Department of Electronics and Information Technology
  - B. Department of Information and Broadcasting

- C. Department of Telecommunication
- D. Department of Posts

**Ans. D**

6. Which one of the following is not the vision area of Digital India as a program to transform India into a digitally empowered society and knowledge economy?
- A. Infrastructure as utility to every citizen
  - B. Governance and services on demand
  - C. Free Wi-Fi access
  - D. Digital empowerment of citizens

**Ans. C**

7. Infrastructure aspects provided by the Government of India in formation of National e-Governance Plan for storage of data and hosting applications, network connectivity and capacity building respectively are
- A. SDC, SWAN and NISG
  - B. SWAN, SDC and NISG
  - C. SDC, NISG and SWAN
  - D. SWAN, NISG and SDC

**Ans. A**

8. Which one of the following is not the characteristic of Good Governance and e-Governance that are closely linked and depend on each other?
- A. Accountable
  - B. Transparent
  - C. Consciousness
  - D. Consensus-oriented

**Ans. C**

9. Which one of the following is not the skill needed in the workplace of the future for inventive thinking using information and communication technology in education?
- A. Adaptability
  - B. Responsibility
  - C. Curiosity and creativity
  - D. Risk-taking

**Ans. B**

**10.** The pedagogy which involves productive learning and finding new solutions to problems, where manipulation of existing information and creation of real-world products are possible with ICT, is called

- A. collaborative pedagogy
- B. creative pedagogy
- C. integrative pedagogy
- D. evaluative pedagogy

**Ans. B**

**11.** The basic difference between a professional and an amateur is

- A. a professional is someone who is connected with a job that needs special training or skill, while an amateur is someone who works in multi-dimensions without any specialization.
- B. a professional is clear in thinking and focused on the job, while an amateur is confused and distracted from the job
- C. a professional does high quality work/job in a specific area, while an amateur is associated with specific area with lowest pay
- D. a professional remains positive and achieves despite facing grievances, while an amateur does work efficiently due to many imagined grievances

**Ans. A**

**12.** 'Euthanasia' refers to the

- A. loyalty of the people that take pride in being part of their organization and care for the organization above their own well-being
- B. ills in the society that are caused by ignorance and lack of respect for the laws of the land

- C. emotional intelligence to understand how people perform various functions
- D. killing of a terminally ill person suffering acutely with no hope of survival

**Ans. D**

**13.** 'Utilitarianism' in the professional ethics is

- A. an acquired habit that helps to lead a rational life
- B. a skill to solve a current ethical problem by comparing it with similar problems from the past and their outcome
- C. a right of activists to decide their own duties
- D. a judgment of an action by the consequences of that action

**Ans. D**

**14.** In the professional ethics, the degree of safety proposed to be attained varies with

- A. design, duration and product
- B. cost of risk, design and utility
- C. cost of risk, perception and utility
- D. product, perception and cost of risk involved

**Ans. B**

**15.** The basic ethical principle of 'Beneficence' states that

- A. all our thoughts and actions must be directed to ensure that others benefit from these thoughts and actions
- B. our actions must result in the least harm to the others
- C. we should not impose our views on others
- D. our actions must be fair to everyone

**Ans. A**

**16.** Which of the following are the main functions of WTO?

- (1) To organize meetings of member countries to arrive at trade agreements covering international trade
- (2) To ensure that member countries conduct trade practices as per agreements agreed upon and signed by the member countries
- (3) To provide a platform to negotiate and settle disputes related to international trade between and among member countries

- A. 1 and 2 only      B. 1 and 3 only
- C. 2 and 3 only      D. 1, 2 and 3

**Ans. D**

**17. Statement (I):** If the project influence is more in decision-making for the project, then the arrangement is considered a strong matrix.

**Statement (II):** If functional departments are seen to be influencing the decision-making more, the arrangement is considered a weak matrix.

**Ans. B**

**18. Statement (I):** Raw materials are taken as traded items and their values at domestic and world prices are estimated.

**Statement (II):** Raw materials, which have a high value-to-volume ratio and involve proportionately high transport cost and are imported, are regarded as non-traded items.

**Ans. C**

**19. Statement (I):** Information and Communication Technologies (ICTs) can facilitate improved service delivery and more efficient internal operations.

**Statement (II):** ICTs can create new opportunities for the marginalized and the vulnerable of society but do not represent a panacea for all development problems.

**Ans. B**

**20. Statement (I):** Long-term sustainability of e-Governance projects does not depend on financial viability, especially if they are to be implemented in the Public-Private Partnership (PPP) mode.

**Statement (II):** Front-end e-services are possible without back-end computerization.

**Ans. D**

**21.** Find the absolute maximum and minimum values of

$$f(x, y) = 2 + 2x + 2y - x^2 - y^2$$

on triangular plate in the first quadrant, bounded by the lines  $x = 0$ ,  $y = 0$  and  $y = 9 - x$ .

- A. -4      B. -2
- C. 4      D. 2

**Ans. C**

**22.** For the matrix

$$A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$$

the expression  $A^5 - 4A^4 - 7A^3 + 11A^2 - A - 10I$

is equivalent to

- A.  $A^2 + A + 5I$       B.  $A + 5I$
- C.  $A^2 + 5I$       D.  $A^2 + 2A + 6I$

**Ans. B**

**23.** The solution of the differential equation  $(1 + y^2)dx = (\tan^{-1} y - x) dy$  is

- A.  $x = \tan^{-1} y + 1 + ce^{-\tan^{-1} y}$
- B.  $x = \tan^{-1} y - 1 + ce^{-\tan^{-1} y}$
- C.  $x = \frac{1}{2} \tan^{-1} y - 1 + ce^{-\tan^{-1} y}$
- D.  $x = \frac{1}{2} \tan^{-1} y + 1 + ce^{-\tan^{-1} y}$

**Ans. B**

24. The value of

$$\Delta^{10} [(1 - ax)(1 - bx^2)(1 - cx^3)(1 - dx^4)]$$

is

- A. abcd (10!)                      B. abcd (9!)  
C. abcd (8!)                        D. abcd (7!)

**Ans. A**

25. If  $u = \log_e \left( \frac{x^4 + y^4}{x + y} \right)$ , the value of  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$

is

- A. 6                                      B. 5  
C. 4                                      D. 3

**Ans. D**

26. The general value of  $\log(1 + i) + \log(1 - i)$  is

- A.  $\log 2 - 4n\pi i$                       B.  $\log 2 + 4n\pi i$   
C.  $\log 2 + 2n\pi i$                       D.  $\log 2 - 2n\pi i$

**Ans. C**

27. A bag contains 4 white and 2 black balls and another bag contains 3 of each colour. A bag is selected at random and a ball is drawn at random from the bag chosen. The probability of the white ball drawn is

- A.  $1/3$                                       B.  $1/4$   
C.  $5/12$                                     D.  $7/12$

**Ans. D**

28. X is a continuous random variable with probability density function given by

$$\begin{aligned} f(x) &= kx & (0 \leq x < 2) \\ &= 2k & (2 \leq x < 4) \\ &= -kx + 6k & (4 \leq x < 6) \end{aligned}$$

The value of k will be

- A.  $2/3$                                       B.  $1/8$   
C. 1                                         D. 8

**Ans. B**

29. The first moment about origin of binomial distribution is

- A. np                                        B. npq  
C.  $n(1 - p)$                               D.  $n(1 - p)q$

**Ans. A**

30. For the regression equations:

$$y = 0.516x + 33.73 \text{ and } x = 0.512y + 32.52$$

the means of x and y are nearly

- A. 67.6 and 68.6                      B. 68.6 and 68.6  
C. 67.6 and 58.6                      D. 68.6 and 58.6

**Ans. A**

31. In a rectangular hyperbola, if a curve is traced out by a point moving in such a way that the product of its distances from two fixed lines at right angles to each other is a constant, then those fixed lines are called

- A. asymptotes                          B. intercepts  
C. holes                                    D. limits

**Ans. A**

32. The line passing through the focus and perpendicular to the directrix is called

- A. axis                                      B. vertex  
C. eccentricity                          D. conic

**Ans. A**

33. Dimensions in a series may be placed in any one of the following ways, except

- A. progressive dimensioning  
B. proportional dimensioning  
C. continuous dimensioning  
D. chain dimensioning

**Ans. B**

34. Among the effects of design specifications on costs, which one of the following is the most significant that influences the producibility of end product?

- A. Standard size                          B. Large tolerance  
C. Breakeven point                      D. Cost estimate

**Ans. B**

35. Which one of the following is not the best approach for the prevention of product liability?

- A. Analysis and design  
B. Quality control  
C. Comprehensive testing  
D. Cost

**Ans. D**

36. Which one of the following is not the way of estimating the statistical parameters and is integral part of analysis or synthesis tasks when probability of failure is involved?
- A. Propagation of error
  - B. Propagation of uncertainty
  - C. Propagation of weight
  - D. Propagation of dispersion

**Ans. C**

37. In order to limit the seriousness of an accident, emergency controls should be provided with which of the following as determining factors in the location of emergency stops?
- A. Speed and ease of operation
  - B. Common sense of workers
  - C. Nearest exits and checkpoints
  - D. Supervisors and decision-makers

**Ans. A**

38. Human engineering approach is followed to prevent accidents by giving due consideration to physical and mental limitations of the workers by
- A. giving constant attention to how a worker is likely to react rather than how supervisor would like him to react
  - B. imposing too many safety rules
  - C. not permitting to make safety device or guard inoperative
  - D. giving first-aid attention in case of injury

**Ans. A**

39. Which one of the following is not an operator error through triggers leading to an accident which confuses and traps into making mistake?
- A. Faulty design or construction of machine tool

- B. Poor housekeeping and cleanliness
- C. Standard operating safety practice
- D. Lack of standardization and identification

**Ans. A**

40. Which one of the following is not included in the safety program for achieving good results during the prevention of accidents?
- A. Development of safe working conditions
  - B. Promotion of employees participation in safety
  - C. Compensation and medical payment
  - D. Corrective action when safety rules are ignored

**Ans. C**

41. During an assessment of economic viability of project, the ratio of average annual earnings after tax to the average book investment after depreciation is called
- A. Benefit-Cost Ratio (BCR)
  - B. Net Present Value (NPV)
  - C. Pay-Back Period (PBP)
  - D. Return on Investment (ROI)

**Ans. D**

42. Who is responsible for the following activities in a project?
1. Achieving a unity of control over project activities
  2. Having an authority to control project matters and disburse funds from the budget
  3. Having no actual line of authority over workers
- A. Project Expeditor
  - B. Project Coordinator
  - C. Matrix Manager
  - D. Project Manager

**Ans. B**

43. The creative technique applied when the available and required inputs as well as the desired outputs are listed, is
- A. attribute listing      B. direct dreaming  
C. black box              D. Delphi

**Ans. C**

44. The market price per share of a company is Rs 125. The dividend per share (DPS) expected a year is Rs 12 and DPS is expected to grow at a constant rate of 8% per annum. The cost of the equity capital to the company will be
- A. 17.6%                  B. 15.4%  
C. 13.2%                  D. 11.8%

**Ans. A**

45. Which one of the following risks can be reduced by investing in projects or acquiring other firms that have a negative correlation with the earnings of the firm?
- A. Investment risk      B. Business risk  
C. Financial risk        D. Portfolio risk

**Ans. D**

46. An individual investor who invests in the e-project usually during an early stage is
- A. Corporate strategic investor  
B. Founder capital  
C. Angel investor  
D. Venture capital

**Ans. C**

47. If the nominal rate of interest is 12% and is compounded quarterly, the effective rate of interest per annum will be nearly
- A. 10.8%                  B. 12.6%  
C. 14.4%                  D. 16.2%

**Ans. B**

48. In a bank, deposits can be made for periods ranging from 6 months to 10 years. Every

quarter, an interest will be added on to the principal. The rate of interest applied is 9% per annum for periods from 12 months to 23 months and 10% per annum for periods from 24 months to 120 months. An amount of Rs 1,000 invested for 2 years to grow, will be nearly

- A. Rs 1,218                  B. Rs 1,334  
C. Rs 1,414                  D. Rs 1,538

**Ans. A**

49. A company has issued Rs 20 million worth of non-convertible debentures, each at a face value of Rs 100 at the rate of 12%. Each debenture is redeemable at a premium of 5%, after 10 years. If the net amount realized is Rs 95 and tax rate is 40%, the cost per debenture will be

- A. 5.8%                      B. 6.6%  
C. 7.4%                      D. 8.2%

**Ans. D**

50. A cybernetic control system that acts to reduce deviations from standard is called

- A. a negative feedback loop  
B. a positive feedback loop  
C. a closed loop  
D. an open loop

**Ans. A**

51. In which one of the following types of bonds, the bond formation is by free moving electrons in an array of positive ions?

- A. Homopolar bond  
B. Electrostatic bond  
C. Metallic bond  
D. Covalent bond

**Ans. C**

- 52.** If a pair of one cation and one anion is missing in an ionic crystal such that those pairs of ions are equal to maintain electrical neutrality, then that pair of vacant sites is called
- A. Schottky imperfection
  - B. Pair of vacancies
  - C. Frenkel defect
  - D. Point imperfection

**Ans. A**

- 53.** Which of the following are the characteristics of covalent compounds?
- 1. They are mostly gases and liquids
  - 2. They are usually electric insulators.
  - 3. They are directional in nature.
  - 4. They are insoluble in polar solvents like water but are soluble in non-polar solvents.
- A. 1, 2 and 3 only    B. 1, 2 and 4 only  
C. 1, 3 and 4 only    D. 1, 2, 3 and 4

**Ans. D**

- 54.** The photoelectric current depends on which of the following factors?
- 1. The frequency of the incident light
  - 2. The intensity of the incident light
  - 3. The potential difference between the electrodes
  - 4. The photosensitivity of the non-metal
- A. 1, 2 and 4                      B. 1, 2 and 3  
C. 1, 3 and 4                      D. 2, 3 and 4

**Ans. B**

- 55.** Which one of the following statements is correct regarding ductile fracture?
- A. Fractured surfaces are crystalline in appearance.
  - B. There is virtually no reduction in cross-sectional area during fracture.
  - C. Fracture takes place after necking with little sound.

- D. Percentage elongation is about 60% prior to fracture occurs.

**Ans. C**

- 56.** Which of the following factors are affecting critical shear stresses?
- 1. Purity of metals reduces the critical shear stress
  - 2. Surface films greatly enhance the critical shear stress
  - 3. Rise in temperature
  - 4. Rate of deformation and the extent of initial deformation also help in raising the critical shear stress
- A. 1, 2 and 3 only    B. 1, 2 and 4 only  
C. 1, 3 and 4 only    D. 1, 2, 3 and 4

**Ans. D**

- 57.** Which one of the following types of materials is having high remanence, coercivity and saturation flux density as well as low permeability and high hysteresis energy losses?
- A. Soft magnetic materials
  - B. Hard magnetic materials
  - C. Hard electrical materials
  - D. Soft electrical materials

**Ans. B**

- 58.** Polymers having strong primary bonds throughout, often formed by condensation polymerization, and their structure resembles one large molecule, are known as
- A. thermoplastic polymers
  - B. thermosoftening polymers
  - C. thermosetting polymers
  - D. random polymers

**Ans. C**



59. An FET is a semiconductor device with the output current controlled by an electric field and its current is carried predominantly by one type of carriers. It is known as
- A. junction transistor
  - B. unipolar transistor
  - C. MOSFET
  - D. IGBT

**Ans. C**

60. Which one of the following is the trade name of polycarbonates?
- A. Alathon
  - B. Baylon
  - C. Bexphane
  - D. Cycloac

**Ans. B**

61. Which of the following departments ensure the quality of the product?
- 1. Product design and development
  - 2. Marketing and product planning
  - 3. Packaging and shipping
  - 4. Sales
- A. 1, 2 and 3
  - B. 1, 2 and 4
  - C. 1, 3 and 4
  - D. 2, 3 and 4

**Ans. A**

62. Which of the following are the general subareas of quality control?
- 1. Off-line quality control
  - 2. Sales/market share
  - 3. Statistical process control
  - 4. Acceptance sampling plans
- A. 1, 2 and 3
  - B. 1, 3 and 4
  - C. 1, 2 and 4
  - D. 2, 3 and 4

**Ans. B**

63. Which of the following steps come under 14-step plan for quality improvement?
- 1. Ad hoc committee for the zero defects program
  - 2. Cost of quality evaluation
  - 3. Quantity measurements

- 4. Supervisor training
- A. 1, 2 and 3
  - B. 1, 2 and 4
  - C. 1, 3 and 4
  - D. 2, 3 and 4

**Ans. B**

64. An Average Outgoing Quality (AOQ) is

- A.  $\frac{P_a p(N)}{N - n}$
- B.  $\frac{P_a p(N + n)}{N}$
- C.  $\frac{P_a p(N - n)}{n - N}$
- D.  $\frac{P_a p(N - n)}{N}$

where

$P_a$  = Probability of accepting the lot

$p$  = Incoming lot quality

$N$  = Lot size

$n$  = Sample size

**Ans. D**

65. Which one of the following is the measure of service quality that correlates with the human factors and behavioural characteristics of service quality?

- A. Number of complementary responses based on human traits in delivery of service
- B. Proportion of income tax returns prepared by an agency that have errors
- C. Shabby appearance of a receptionist in a bank or hotel
- D. Inadequate temperature control in a convention meeting room

**Ans. A**

66. Which of the following factors affect the quality of conformance in construction?

- 1. Site construction methods
  - 2. Technical specifications
  - 3. Engineering and design process
  - 4. Supervision and control
- A. 1 and 3
  - B. 2 and 3
  - C. 2 and 4
  - D. 1 and 4

**Ans. D**

**67.** Which of the following considerations are important during inspection of the work in prestressed concrete works?

1. Sheathings are threaded properly including correct threading of couplers and taping of joints
2. Only approved sheathings, HTS strands, anchor heads and wedges are to be used
3. Splicing of reinforcement to be provided at the joints

- A. 1, 2 and 3                      B. 1 and 2 only  
 C. 1 and 3 only                    D. 2 and 3 only

**Ans. B**

**68.** The standard deviation  $\sigma$  for sampling in the case of concrete for construction engineering and management is

- A.  $\sqrt{\frac{\sum (X + \bar{X})^2}{N + 1}}$                       B.  $\sqrt{\frac{\sum (X - \bar{X})^2}{N + 1}}$   
 C.  $\sqrt{\frac{\sum (\bar{X} - X)^2}{N - 1}}$                       D.  $\sqrt{\frac{\sum (X - \bar{X})^2}{N - 1}}$

where

$X_1, X_2, X_3, X_4, \dots X_n$  = Compressive strengths of the individual cubes

$N$  = Number of cubes tested

$\bar{X}$  = Average of series of compressive strength values

**Ans. D**

**69.** Which of the following variations are true in piece part production?

1. Piece-to-piece variation
2. Time-to-time variation
3. Within-piece variation
4. Process-to-process variation

- A. 1, 2 and 4                      B. 1, 3 and 4  
 C. 2, 3 and 4                      D. 1, 2 and 3

**Ans. D**

**70.** Which one of the following is the objective of attribute charts in production process control?

- A. To determine the acceptance criteria of a product before production
- B. To evaluate the quality performance of operating and management personnel
- C. To keep a periodic record of a particular characteristic
- D. To determine the highest quality level

**Ans. B**

**71.** Which one of the following regions is characterized by sensitive ecosystems, enhanced occurrences of extreme weather events and natural catastrophes?

- A. Mountain region
- B. Evergreen forest region
- C. Tropical region
- D. Tundra region

**Ans. C**

**72.** Which one of the following is an iterative and evolutionary process for achieving sustainable development?

- A. Flood Control Management (FCM)
- B. Solid Waste Management (SWM)
- C. Integrated Coastal Zone Management (ICZM)
- D. Natural Ecosystem Zone (NEZ)

**Ans. C**

**73.** Which of the following practices are adopted for river basin water resources management?

1. Soil conservation in catchments of river valley projects and flood-prone rivers.
2. Soil and land use surveys
3. Control of shifting cultivation
4. Deforestation

- A. 1, 2 and 4                      B. 1, 3 and 4  
 C. 2, 3 and 4                      D. 1, 2 and 3

**Ans. D**

**74.** According to the Stokes' law, the rate of settling of the particles depends on the terminal settling velocity  $v_t$  which is

A.  $\frac{gd_p^2}{18\mu_a}(\rho_p - \rho_a)\left(1 + \frac{2C}{d_p\rho}\right)$

B.  $\frac{gd_p^2}{18\mu_a}(\rho_p + \rho_a)\left(1 - \frac{2C}{d_p\rho}\right)$

C.  $\frac{gd_p^2}{18\mu_a}(\rho_p - \rho_a)\left(1 - \frac{2C}{d_p\rho}\right)$

D.  $\frac{gd_p^2}{18\mu_a}(\rho_p + \rho_a)\left(1 + \frac{2C}{d_p\rho}\right)$

Where,

$d_p$  = particle diameter

$\rho_p$  = density of particle

$\rho_a$  = density of air

$\mu_a$  = viscosity of air

$P$  = air pressure

$C$  = constant

**Ans. A**

**75.** The sound level  $L$  is

A.  $\log_{10} \frac{Q_0}{Q}$  (bels)

B.  $20 \log_{10} \frac{Q}{Q_0}$  (bels)

C.  $\log_{10} \frac{Q}{Q_0}$  (bels)

D.  $20 \log_{10} \frac{Q}{Q_0} + \log_{10} \frac{Q}{Q_0}$  (bels)

Where,

$Q$  = measured quantity of sound pressure or sound intensity

$Q_0$  = reference standard quantity of sound pressure

**Ans. C**

**76.** Which one of the following is a hygienic way of disposing solid waste and is more suitable if the waste contains more hazardous material and organic content?

- A. Composting                      B. Incineration  
C. Oxidation                          D. Subgrading

**Ans. B**

**77.** NEPA stands for

- A. National Ecological Physical Area  
B. Natural Environmental Policy Act  
C. National Environmental Policy Act  
D. Natural Ecological Primary Area

**Ans. C**

**78.** Which one of the following gases is colourless with strong odour, irritates mucous membranes at common levels, can cause cough, fatigue and interference with lung functions at higher concentration?

- A. Carbon monoxide  
B. Hydrogen  
C. Ozone  
D. Nitrogen

**Ans. C**

**79.** Basel convention provides

- A. Indian standards for pollution measurement and prevention  
B. International guidelines to control the transboundary movements of hazardous wastes between different countries  
C. Indian standards for the disposal of municipal and industrial wastes  
D. International standards to categorize pollution in air and wastewater

**Ans. B**

**80.** Which of the following are the suggested ways of reducing NO<sub>x</sub> emissions from stationary sources?

1. By reducing the peak temperature
2. By increasing the availability of N<sub>2</sub> for reaction with O<sub>2</sub>
3. By minimizing the availability of O<sub>2</sub> for reaction with N<sub>2</sub>

- A. 1 and 2 only      B. 1 and 3 only  
C. 2 and 3 only      D. 1, 2 and 3

**Ans. B**

**81.** What is TADF?

- A. Technology Acquired Desired Firm
- B. Technologically Advanced Direct Fund
- C. Technologically Accomplished Direct Fund
- D. Technology Acquisition and Development Fund

**Ans. D**

**82.** Technical textiles are

- A. the high-tenacity fibres which are lightest and toughest fabrics mainly used in automobile and aerospace industries
- B. the toughest fabrics which are much heavier than polyester and used in power industries
- C. the toughest fabrics having rigidity mainly used in polyhouse construction
- D. the high-tenacity fabrics having fire resistance property

**Ans. A**

**83.** Which one of the following is a measure of sustainable income level that can be secured without decreasing the stock of natural assets?

- A. Natural Capital Stock
- B. Environmental value
- C. Green Accounting
- D. Social discount rate

**Ans. C**

**84.** Which one of the following is a resource allocation as per Chenery's development process?

- A. Investment
- B. Structure of domestic demand
- C. Labour allocation
- D. Government revenue

**Ans. B**

**85.** Which one of the following ratios is referred to as everything that has been invested in the past and to the whole income?

- A. Capital-output ratio
- B. Average capital-output ratio
- C. Incremental capital-output ratio
- D. Marginal ratio

**Ans. B**

**86.** Which one of the following methods of planning is an attempt to work out the implications of the allocations and product yields so as to maximize income and employment?

- A. Perspective planning
- B. Physical planning
- C. Financial planning
- D. Indicative planning

**Ans. C**

**87.** Which one of the following reflects an intrinsic or true value for factors or products?

- A. Price inflation
- B. Economy pricing
- C. Penetration pricing
- D. Shadow price

**Ans. B**

88. Which one of the following control policies leaves no freedom to private enterprise to buy plant, machinery, raw materials from the country of its choice?
- A. Import control      B. Export control  
C. Exchange control    D. Physical control

**Ans. A**

89. Which one of the following is a particular form of collusive price-fixing behaviour by which firms coordinate their bids on procurement or project contracts?
- A. Predatory pricing  
B. Horizontal price-fixing (collusion)  
C. Bid rigging  
D. Exclusive territory

**Ans. C**

90. Which one of the following is an example of horizontal practice of firm?
- A. Refusal to deal  
B. Retail price maintenance  
C. Predatory pricing  
D. Exclusive territory

**Ans. C**

91. Ten years ago father was 12 times as old as his son and after 10 years father will be 2 times older than his son. The present ages of father and son respectively are
- A. 32 years and 14 years  
B. 34 years and 14 years  
C. 32 years and 12 years  
D. 34 years and 12 years

**Ans. D**

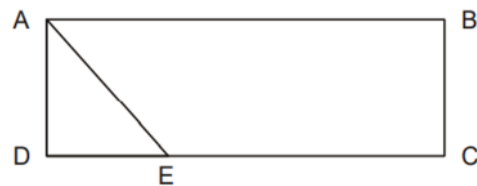
92. A number of friends decided to go on a picnic and planned to spend Rs 96 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs 4 each extra. The number of those friends who attended the picnic is
- A. 8                                      B. 12  
C. 16                                     D. 20

**Ans. A**

93. Consider the following gold articles P, Q, R, S and T with different weights:
- P weighs twice as much as Q
  - Q weighs four and a half times as much as R
  - R weighs half as much as S
  - S weighs half as much as T
  - T weighs less than P but more than R
- Article T will be lighter in weight than
- A. P and S                              B. P and R  
C. P and Q                             D. Q and R

**Ans. C**

94. Consider the rectangle ABCD with  $DE = \frac{1}{3}DC$  in the figure



- When the area of the triangle ADE is  $20 \text{ cm}^2$ , the area of the rectangle ABCD will be
- A.  $60 \text{ cm}^2$                               B.  $80 \text{ cm}^2$   
C.  $100 \text{ cm}^2$                              D.  $120 \text{ cm}^2$

**Ans. D**

**95.** Four metal rods of lengths 78 cm, 104 cm, 117 cm and 169 cm are to be cut into parts of equal length. Each part must be as long as possible. The maximum number of pieces that can be cut will be

- A. 27                      B. 36  
C. 43                      D. 52

**Ans. B**

**96.** A man walked 3 km towards East, then 5 km towards North-East, then 8 km towards South and finally 5 km towards North-East direction. The distance of his present location from the starting point will be

- A. 9 km                    B. 11 km  
C. 15 km                 D. 21 km

**Ans. B**

**97.** A clock strikes once at 1 o'clock, twice at 2 o'clock, thrice at 3 o'clock and so on. The number of times it strikes in 24 hours will be

- A. 116                    B. 136  
C. 156                    D. 196

**Ans. C**

**98.** The sum of all the natural numbers between 1 and 101 which are divisible by 5 is

- A. 1000                    B. 1050  
C. 1500                    D. 2550

**Ans. B**

**99.** In a group of 1000 people, 750 speak Hindi and 400 speak English. The number of only Hindi speaking people is

- A. 150                    B. 350  
C. 600                    D. 750

**Ans. C**

**100.** Consider the following students in an examination:

- A scored more than B
- C scored as much as D
- E scored more than F
- B scored more than C
- F scored more than D

Who scored the lowest?

- A. E                        B. C  
C. D                        D. F

**Ans. A**

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