



Booklet Series



22/AE/CM/M–2024-06

Question Booklet

MECHANICAL ENGINEERING – II

Paper – VI

Booklet Serial No.

Candidate's Roll Number

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Time Allowed : 01 Hour

Maximum Marks : 100

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Question Booklet contains **50** questions in all.
2. All questions carry equal marks.
3. Attempt **all** questions.
4. An Answer Sheet has been supplied inside the question booklet to mark the answers. **You must write your Roll Number and encode it and write other particulars in the space provided in the Answer Sheet, failing which your Answer Sheet will not be evaluated.**
5. **Immediately after commencement of the examination, you should check up your Question Booklet and attached answer sheet and ensure that the Question Booklet Series is printed on the top left-hand corner of the Booklet and the series encoded in answer sheet are same. Also please check that the Booklet contains 12 printed pages including 2 pages (Page Nos. 11 and 12) for Rough Work and no page or question is missing or unprinted or torn or repeated or question booklet and answer sheet have different series. If you find any defect in this Booklet and attached answer sheet, get it replaced immediately by a complete Booklet with OMR sheet of the same series.**
6. You must write your Roll Number in the space provided on the top of this page. Do not write anything else on the Question Booklet.
7. Questions and their responses are printed in English version in this Booklet. Each question comprises of **four** responses — (A), (B), (C) and (D). You are to select **ONLY ONE** correct response and mark it in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
8. In the Answer Sheet, there are **four** circles — (A), (B), (C) and (D) against each question. To answer the questions, you are to mark with **Black/Blue ink ballpoint pen ONLY ONE circle** of your choice for each question. Select only one response for each question and mark it in your Answer Sheet. If you mark more than one circle for one question, the answer will be treated as wrong. **Use Black/Blue ink ballpoint pen only to mark the answer in the Answer Sheet. Any erasure or change is not allowed.**
9. You should not remove or tear off any sheet from the Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. **After the examination has concluded, you must hand over your Answer Sheet to the Invigilator.** Thereafter, you are permitted to take away the Question Booklet with you.
10. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
11. Candidates must assure before leaving the Examination Hall that their Answer Sheets will be kept in Self Adhesive LDPE Bag and completely packed/sealed in their presence.



1. The rate of decay of oscillations is known as

- (A) Transmissibility
- (B) Damping coefficient



(C) Logarithmic decrement

(D) Critical damping

2. The variation of circumferential stress across the thickness of a thick cylinder is

- (A) Uniform
- (B) Linear



(C) Parabolic

(D) None of the above

3. A closed coil helical spring is subjected to a torque about its axis. The spring wire would experience a

- (A) Bending stress
- (B) Torsional shear stress
- (C) Direct tensile stress
- (D) Direct shear stress

4. Directional solidification in castings can be improved by

- (A) Chills and Padding
- (B) Chaplets and Padding
- (C) Chills, Chaplets and Padding

(D) Chills and Chaplets



5. Work study is concerned with

- (A) Improving present method and finding standard time
- (B) Improving production capability
- (C) Motivation of workers

(D) None of the above



6. In a fillet welded joint, the weakest area of the weld is

- (A) Root
- (B) Face
- (C) Throat
- (D) Toe



7. What is the name of a system which brings together several manufacturing operations into a coherent system ?

(A) Automated integration systems



(B) Flexible manufacturing systems

(C) Focused integration systems

(D) Portable manufacturing systems

8. Two 1 mm thick steel sheets are to be spot welded at a current of 5000 A. Assuming effective resistance to be $200 \mu \text{ ohm}$ and current flow time of 0.2 second, heat generated during the process will be

(A) 1000 Joule

(B) 500 Joule



(C) 0.2 Joule

(D) 0 Joule

9. In industrial engineering, application, PERT has

(A) Two time estimate

(B) Four time estimate

(C) Three time estimate

(D) One time estimate

10. The interference in involute spur gears will increase when

(A) The pressure angle is increased

(B) The module is increased

(C) The centre distance is increased

(D) The number of teeth on the pinion

are reduced



11. A helical compression spring of stiffness K is cut into two pieces, each having equal number of turns and kept side-by-side under compression. The equivalent spring stiffness of this new arrangement is equal to

(A) K



(B) $2K$

(C) $0.5K$

(D) $4K$



12. The stress induced in a body, when suddenly loaded, is _____ the stress induced when the same load is applied gradually.

(A) Twice



(B) One-half

(C) Four times

(D) Equal to

13. When two streams of molten metal do **not** fuse with each other during casting of an automobiles part, the defect is known as

(A) Cold shut

(B) Scab



(C) Dry shut

(D) Pore

14. Brasses and bronze are welded using

(A) Reducing flame

(B) Carburizing flame

(C) Oxidizing flame

(D) Neutral flame

15. When the shafts are slightly misaligned then most suitable coupling to connect them as

(A) Rigid coupling



(B) Flexible coupling

(C) Oldham-hook coupling

(D) None of these

16. Failure of material is called fatigue when it fails

(A) Below the elastic limit



(B) At the yield point

(C) Below the yield point

(D) At the elastic limit

17. CPM is the

(A) Activity-oriented technique

(B) Event-oriented technique

(C) Target-oriented technique

(D) Time-oriented technique



18. If coefficient of speed fluctuation is 0.05 then ratio of maximum to minimum speed is

(A) 1.10



(B) 1.05

(C) 1.01

(D) 1.15

19. If the ratio of rivet hole to the pitch of rivet is 0.25, then the tearing efficiency of the joint is

(A) 0.25

(B) 0.75



(C) 0.87

(D) 0.5

20. Whirling speed of a shaft coincides with the natural frequency of its

(A) Transverse vibration

(B) Coupled bending vibration

(C) Longitudinal vibration

(D) Torsional vibration

21. Hoop stress in a thin cylinder of diameter 'd' and thickness 't' subjected to pressure 'p' will be

(A) $\frac{pd}{2t}$



(B) $\frac{pd}{t}$

(C) $\frac{2pd}{t}$

(D) $\frac{pd}{4t}$

22. While machining which of the following improves surface finish ?

(A) Increased feed rate



(B) Increased cutting speed

(C) Formation of built up edge

(D) Increased depth of cut

23. If the radius of wire stretched by a load is doubled, then its Young's Modulus will be

(A) Becomes four times

(B) Halved

(C) Unaffected

(D) Doubled



24. Which of the following is an example of thermosetting plastics ?



(A) Polyvinyl Chloride (PVC)

(B) Bakelite

(C) Celluloid

(D) Polythene

25. Pitch point on cam is

(A) Any point on pitch circle

(B) The point on cam pitch curve having maximum pressure angle

(C) The point on cam pitch curve having minimum pressure angle

(D) Any point on pitch curve

26. A material capable of absorbing large amount of energy before fracture is known as



(A) Resilience

(B) Toughness

(C) Plasticity

(D) Ductility

27. Removing dull grains in order to make grinding wheel sharp is known as

(A) Dressing



(B) Glazing

(C) Trueing

(D) Loading

28. Tool life is generally better when

(A) Grain size of the metal is large

(B) Hard constituents are present in the microstructure of the tool material

(C) Grain size of the metal is small

(D) None of the above



29. The failure of a key is due to

(A) Bending

(B) Tension

(C) Twisting

(D) Shearing



30. A transmission shaft subjected to bending and torsional moments should be designed on the basis of

(A) Maximum principal stress theory



(B) Permissible bearing pressure

(C) Maximum shear stress theory

(D) None of the mentioned above

31. A cam in which the follower reciprocates or oscillates in a plane parallel to the axis of the cam is known as

(A) Reciprocating cam

(B) Circular cam

(C) Tangent cam



(D) Cylindrical cam

32. Which of the following locating device is used to locate cylindrical jobs ?

(A) V-blocks

(B) Angle plates

(C) Metal pins

(D) Drill jigs

33. If Poisson's ratio of a material is 0.5, then the elastic modulus for the material is

(A) Equal to its shear modulus

(B) 4 times its shear modulus

(C) Indeterminate



(D) 3 times its shear modulus

34. _____ is the phenomenon of slow extension of the material at a constant load during tensile test.

(A) Breaking

(B) Creeping

(C) Plasticity



(D) Yielding

35. In a steam engine, the valve rod is connected to an eccentric rod by means of

(A) Universal joint

(B) Knuckle joint

(C) Flange coupling

(D) Cotter joint



36. In value engineering, the term value refers to

(A) Total cost of the product

(B) Selling price of the product



(C) Utility of the product

(D) Manufacturing cost of the product

37. Major constituents of stellite are

(A) Zinc, Lead and Tin

(B) Nickel, Copper and Zinc

(C) Cobalt, Chromium, Tungsten

(D) Cobalt, Vanadium and Nickel

38. An optimum project schedule implies

(A) Lowest possible cost and shortest possible time of project



(B) Timely execution of project

(C) To produce best results under given constraints

(D) Optimum utilization of men, machines and materials

39. A shaft directly coupled to a power source is called

(A) Line shaft



(B) Counter shaft

(C) Jack shaft

(D) Flexible shaft

40. In CNC programming G-code used for circular interpolation (counter clockwise) is

(A) G 01

(B) G 02

(C) G 00

(D) G 03



41. In a turning moment diagram, the variations of energy above and below the mean resisting torque line is called

(A) Fluctuation of energy

(B) Coefficient of fluctuation of energy

(C) Maximum fluctuation of energy

(D) None of the above



42. Two beams of equal cross section area are subjected to equal bending moment. If one beam has square cross section and the other has circular section, then



- (A) Circular section beam will be stronger
- (B) Square cross section beam will be stronger
- (C) Depends on the loading condition
- (D) Both the beams will be equally strong

43. Machine tool guideways are usually hardened by



- (A) Induction hardening
- (B) Martempering
- (C) Flame hardening
- (D) Vacuum hardening

44. The cutting force in punching and blanking operations mainly depends on

- (A) The bulk modulus of material
- (B) The shear strength of material
- (C) The yield strength of material
- (D) The modulus of elasticity of material

45. Motion and time study in case of product analysis involves

- (A) Man operation chart

- (B) Work place layout



- (C) Multi man operation chart

- (D) Process chart

46. In a computer numerical controlled turning center, the backlash error during longitudinal feed motion is accomplished by



- (A) Gears

- (B) Recirculating ballscrew and nut

- (C) Worm wheels

- (D) Pulley and belt



47. The motion of a nut on a threaded bolt is



(A) Plane

(B) Helical

(C) Spherical

(D) None of the above

48. In an automobile, if the vehicle makes a left turn, the gyroscopic torque



(A) Increase the forces on the outer wheels

(B) Does not affect the forces on the outer wheels

(C) Decreases the forces on the outer wheels

(D) None of these

49. Section modulus (Z) of a beam depends on

(A) Only on length of the beam

(B) Weight of the beam



(C) Density of the beam

(D) The geometry of the cross section

50. Manganese in steel increases its

(A) Ductility



(B) Hardness

(C) Fluidity

(D) Tensile strength



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