

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

TEST BOOKLET
LECT (AUTO ENGG.) T.E.-2016

Time Allowed : 2 Hours]

[Maximum Marks : 100

All questions carry equal marks.

INSTRUCTIONS

1. Immediately after the commencement of the examination, you should check that test booklet does not have any unprinted or torn or missing pages or items, etc. If so, get it replaced by a complete test booklet.
2. Write your Roll Number only in the box provided alongside.
Do not write anything else on the Test Booklet.
3. This Test Booklet contains 100 items (questions). Each item comprises four responses (answers). Choose only one response for each item which you consider the best.
4. After the candidate has read each item in the Test Booklet and decided which of the given responses is correct or the best, he has to mark the circle containing the letter of the selected response by blackening it completely with Black or Blue ball pen. In the following example, response "C" is so marked :

A
 B

 D
5. Do the encoding carefully as given in the illustrations. While encoding your particulars or marking the answers on answer sheet, you should blacken the circle corresponding to the choice in full and no part of the circle should be left unfilled. After the response has been marked in the ANSWER SHEET, no erasing/fluid is allowed.
6. You have to mark all your responses ONLY on the ANSWER SHEET separately given according to 'INSTRUCTIONS FOR CANDIDATES' already supplied to you. Responses marked on the Test Booklet or in any paper other than the answer sheet shall not be examined.
7. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of correct responses marked by you in the Answer Sheet. There will be no negative marking.
8. Before you proceed to mark responses in the Answer Sheet fill in the particulars in the front portion of the Answer Sheet as per the instructions sent to you.
9. If a candidate give more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct.
10. After you have completed the test, hand over the Answer Sheet only, to the Invigilator.

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1. Centrifugally cast automotive parts have :
 - (A) Rough grain structure with low density
 - (B) Fine grain structure with high density
 - (C) Very large grain structure with low density
 - (D) Very large grain structure with high density

2. Knocking tendency in petrol engines reduces with engine speed.
 - (A) Decreasing
 - (B) Increasing
 - (C) Constant
 - (D) Very low

3. Alcohols are not suitable for using as fuel in diesel engines, because
 - (A) The cetane number is low and prevents ignition by compression
 - (B) The propylene number is high and prevents ignition by compression
 - (C) The castrine number is high and prevents ignition by suction
 - (D) None of the above

4. has the unit 'N-m'.
- (A) Kinetic Energy (B) Potential Energy
(C) Shear Force (D) Bending Moment
5. The 'fit' made of a 25 mm H-hole with tolerance grade IT8 and a 25 mm f-shaft with tolerance grade IT7 is represented by :
- (A) 25 O7-f8 (B) 25 F7-g8
(C) 25 O8-H7 (D) 25 H8-f7
6. During an isothermal expansion process of a gas :
- (A) Pressure remains constant
(B) Temperature remains constant
(C) Both pressure and temperature remains constant
(D) None of the above
7. The pressure inside the engine cylinder is atmospheric pressure during suction stroke.
- (A) Above (B) Below
(C) Equal (D) Either below or above

8. Fabry-Perot Interferometer consists of two optical flats coated with high efficiency film on the two facing surfaces.
- (A) Dark (B) Semi-transparent
(C) Opaque and black (D) None of these
9. The criterion in the design of hydrodynamic journal bearing is :
- (A) Revolving factor (B) Sommerfeld number
(C) Bosch number (D) Prandtl number
10. Mechanism having eight links is :
- (A) Porsch (B) Backward quick return
(C) Peaucellier (D) Short link slow return
11. In vortex casing type of chamber is introduced between the casing and the impeller.
- (A) Semi-elliptical (B) Circular
(C) Triangle (D) Hexagonal

12. The only service that a steering linkage normally requires is :

- (A) Piston-rod adjustment
- (B) Lubrication
- (C) Cam grinding
- (D) None of these

13. Entropy at absolute zero temperature is zero for :

- (A) Glass fibre
- (B) Natural perfect gas
- (C) Imperfect and impure substance
- (D) Perfect crystal

14. Newton's law of viscosity relates :

- (A) Temperature and tensile stress
- (B) Shear stress and velocity gradient
- (C) Shear stress and torsional stress
- (D) Pressure and viscosity

15. Cylinder of an I.C. engine is a :
- (A) Elasto-fluid link (B) Elasto-rigid link
(C) Translatory rotating link (D) Fixed link
16. A shaft rotating in bearing forms pair.
- (A) Helical (B) Sliding
(C) Turning (D) Revolving
17. The flux commonly used during soldering is :
- (A) Zinc chloride (B) Si CH
(C) Borax-Si (D) No flux is used
18. Hardness of green sand mould increases with :
- (A) Increase in permeability
(B) Increase in moisture content beyond 4 percent
(C) Increase in both moisture content and permeability
(D) Decrease in permeability

19. deals with relationship between forces and the resulting motion of bodies on which they act.
- (A) Dynamics of elastic bodies (B) Statics
(C) Kinetics (D) Theory of plasticity
20. Maximum value of frictional force acting on a body, when the body is just about to start is called :
- (A) Limiting friction (B) Absolute friction
(C) Relative friction (D) Coefficient of restitution
21. The brake pipe in hydraulic brakes is made up of :
- (A) PMC (B) Steel
(C) Carbon (D) Plastic
22. A M24 × 3 represents a bolt having :
- (A) Outer bolt diameter 24 mm and threads of pitch 3 mm
(B) Nominal bolt diameter 24 mm and threads of pitch 3 mm
(C) Inner bolt diameter 24 mm and threads of pitch 3 mm
(D) None of the above

23. Hot tube extrusion process is used in the manufacture of :

- (A) Stainless steel tubes (B) Large size rods
(C) Aluminum rods (D) None of these

24. Diesel engine works on :

- (A) Constant volume heat addition and constant volume heat rejection
(B) Constant pressure heat addition and constant volume heat rejection
(C) Constant pressure heat addition and constant pressure heat rejection
(D) None of the above

25. Which of the following equations is an equation of motion ?

- (A) $v = u + at^2$ (B) $v^2 - u^2 = 2at$
(C) $s = ut + \frac{1}{2} at^2$ (D) $u = s + at$

26. In cutting tools, crater wear develops at :
- (A) The principal flank (B) The tool nose radius
(C) The side shank (D) The rake surface
27. Spur gears used for connecting
- (A) Shafts intersecting at 45 degrees
(B) Parallel shafts
(C) Non-parallel, non-intersecting shafts
(D) Shafts intersecting at 90 degrees
28. Piston compression rings are manufactured by :
- (A) Aluminium-WC (B) Cast iron
(C) HSS (D) Any material
29. A truss having 4 joints and 7 members is termed as truss.
- (A) Perfect (B) Imperfect or deficient
(C) Redundant (D) None of these

30. If compression ratio is increased :
- (A) Thermal efficiency will be increased
 - (B) Polytropic efficiency will be increased
 - (C) Petrol efficiency will be decreased
 - (D) Air standard efficiency will be increased
31. The angle of rotation from the instant of spark to TDC position of the piston is known as :
- (A) Spark delay
 - (B) Spark advance
 - (C) Spark inlay
 - (D) Spark timer
32. For a cantilever beam of length 'L' having a point load 'P' at its free end, the bending moment at the mid-span of the beam is given by :
- (A) PL
 - (B) $(P/2)L$
 - (C) P/L
 - (D) L/P

33. In the transmission system, the provision of slip joints allows a change in the :
- (A) Angle of gear (B) Length of shaft
(C) Turning angle (D) None of these
34. In two-stroke engines the valve ports are provided at :
- (A) Crankshaft (B) Piston
(C) Cylinder walls (D) None of these
35. The unit of torsional stress in SI units is :
- (A) Kg/m^2 (B) Kg-m
(C) N/m^2 (D) N-m
36. Net force on a control volume due to uniform normal pressure alone :
- (A) Pure translation (B) Pure rotation
(C) Pure deformation (D) Translation and deformation

37. Instantaneous centre of rotation has a velocity equal to :
- (A) Zero (B) Unity
(C) Between 1 and 2 (D) More than 2
38. The velocity of any point 'P' on a body rotating with angular velocity ' ω ' and with instantaneous centre of rotation 'I' is equal to :
- (A) $P/\omega I$ (B) $IP\omega$
(C) $I/P\omega^2$ (D) $I^2P\omega^2/2$
39. In a V-block, if a cylinder is located then the number of d.o.f. which are arrested is :
- (A) 0 (B) 2
(C) 7 (D) 12
40. In the plate cam mechanism with reciprocating follower, in motion the follower has a constant acceleration.
- (A) Parabolic (B) MHS
(C) Sino-cycloidal (D) None of these

41. A family of directions is represented by :

(A) $\{hkl\}$

(B) (hkl)

(C) $[uvw]$

(D) $\langle uvw \rangle$

42. A is formed by two equal magnitude and opposite direction forces displaced by perpendicular distance.

(A) Bending moment

(B) Couple

(C) Shear moment

(D) None of these

43. Toe-in is adjusted by :

(A) Adding slims

(B) Changing the effective length of the tie rods

(C) Changing gear trains with crank

(D) None of the above

44. Normal force acts to the direction of the surfaces in contact.

(A) Perpendicular

(B) At an angle

(C) Tangential

(D) None of these

45. On principal plane the principal stress is :
- (A) Maximum/Minimum
 - (B) Zero
 - (C) Unity
 - (D) Depends on applied strain
46. are strong and ductile materials.
- (A) Polymer fibers
 - (B) Porcelain
 - (C) Metals
 - (D) Charcoal
47. is not related to non-conventional machining.
- (A) EDM
 - (B) LBM
 - (C) PAM
 - (D) Machining centre
48. End effector of a Robot can have motion.
- (A) M-P-Y
 - (B) P-P-Z
 - (C) R-G-B
 - (D) R-P-Y

49. The injected fuel evaporates and it is injected at various points along the stream in :
- (A) Carburettor (B) Economiser
(C) MPFI (D) MDIF
50. Supersonic diffusers have geometry.
- (A) Only convergent
(B) Only divergent
(C) Divergent and convergent respectively
(D) Uniform
51. Ante-chambers are sometimes provided in an I.C. Engine as :
- (A) Pre-combustion chamber
(B) Post-combustion chamber
(C) Combustion chamber
(D) Exhaust chamber
52. type nozzle can be used in automobiles for converting the high pressure of fuel into velocity.
- (A) Prandtl (B) Bezier
(C) Pintle (D) Ericsson

53. The point at which the centre line of the wheel and the centre line of the ball joints cross is called the point of :
- (A) Intersection (B) Aperture
(C) Cross-section (D) None of these
54. When two streams of molten metal do not fuse with each other during casting of an automobile part, the defect is known as :
- (A) Pore (B) Scab
(C) Cold shot (D) Dry shot
55. Industrial Robots used in automobile industry are made of series of links and
- (A) Bearings (B) Joints
(C) Valves (D) None of these
56. Microkater are used :
- (A) As comparator (B) As slip micro gauge
(C) For force measurement (D) As hardness tester

57. is an example for machine tool.
- (A) Single point cutting tool (B) Multipoint cutting tool
(C) Milling cutter (D) Shaper
58. In the governor stops the flow of fuel in the engine cylinder which will then perform the idle cycle.
- (A) Run and Miss Governing
(B) Quantitative/Qualitative Governing
(C) Hit and Miss Governing
(D) None of the above
59. Poppet valve is also known as :
- (A) Star valve (B) Mushroom valve
(C) Direct valve (D) Booster valve
60. With speed of rotation the spark will be advanced in I.C. engine.
- (A) Increased (B) Decreased
(C) Zero (D) None of these

61. In S.I. engines ignition system can be used.
- (A) Thermo-fluid (B) Magneto
(C) Colman (D) Condensate
62. Flat head engines are also known as engine.
- (A) G-Head (B) O-Head
(C) L-Head (D) Z-Head
63. If a large amount of mixture in an engine cylinder auto ignites rapid rise in pressure occurs causing a direct blow on the engine structure is known as :
- (A) Knock (B) Block
(C) Choke (D) Pinkerling
64. At point of contraflexure in beam subjected to loading :
- (A) Shear force is zero
(B) Bending moment is zero
(C) Bending moment is maximum
(D) Shear force is unity

65. $C_{16}H_{34}$ is fuel.

(A) Cetane

(B) Heptane

(C) Methane-alcohol

(D) Butane-propylene

66. Etchants are used in process.

(A) USM

(B) EDM

(C) AJM

(D) ECM

67. *n*-heptane has knocking tendency.

(A) Maximum

(B) Minimum

(C) Nil

(D) None of these

68. Merchant Circle diagram is used in :

(A) Stress analysis

(B) Strain analysis

(C) Torque measurement

(D) Force analysis in metal cutting

69. G00 code is used in :

- (A) Robots
- (B) AGV
- (C) CNC machines
- (D) PTER

70. Castigliano's theorem is used to determine :

- (A) Deflection
- (B) Stress
- (C) Torque
- (D) None of these

71. Ratio of brake power to swept volume is known as :

- (A) Input
- (B) Specific input
- (C) Specific output
- (D) Relative efficiency

72. The other name for Hooke's joint is

- (A) Oldham coupling
- (B) Universal coupling
- (C) Rigid coupling
- (D) None of these

73. Statistical quality control concept was initially developed by :

(A) Francis

(B) Otto

(C) Newton

(D) Walter Shewart

74. Barium based fuel additives in C.I. engines contributes to :

(A) Control of emission

(B) More pollution

(C) Insufficient combustion

(D) Knocking

75. The column of Milling machine is made of :

(A) Aluminum

(B) Cast Iron

(C) High speed steel

(D) Any metal

76. UTS is always breaking strength of mild steel.

(A) Equal to

(B) Less than

(C) More than

(D) None of these

77. In spur gears, the circle on which the involute is generated is called the :
- (A) Pitch circle (B) Clearance circle
(C) Base circle (D) Addendum circle
78. Volume of 1 kg of dry steam is known as :
- (A) Total volume (B) Saturated volume
(C) Specific volume (D) None of these
79. The process of superheating follows :
- (A) Reynolds' law (B) Stefan-Boltzmann's law
(C) Charles' law (D) Ernst law
80. Section modulus (Z) of a beam depends on :
- (A) The geometry of the cross-section
(B) Weight of the beam
(C) Only on length of the beam
(D) Density of the beam

81. Which of the following is on the bank of Lunkhari Khad ?

(A) Gagret

(B) Amb

(C) Bangana

(D) Una

82. Which pass joins Lahul and Ladakh ?

(A) Nikora

(B) Bara Lacha

(C) Padri

(D) Shipki

83. Which raja of Sirmaur helped Mahan Chand of Kehlur when Raja Sansar Chand invaded his state ?

(A) Dharam Parkash

(B) Karam Parkash

(C) Kirat Parkash

(D) Bhup Parkash

84. Which raja founded the Chamba princely state at Bharmaur around 550 AD ?

(A) Sahil Varman

(B) Bala Varman

(C) Kartar Varman

(D) Meru (or Maru) Varman

85. Which youngman from Mandi princely state joined the Gadhar Party at San Francisco around 1914-15 ?
- (A) Kanshi Ram (B) Hardev
(C) Netar Singh (D) Nidhar Singh
86. In which District of H.P. is Binwa hydel project ?
- (A) Chamba (B) Kangra
(C) Mandi (D) Kullu
87. Holi festival/fair of which place has been given the status of state level festival/fair ?
- (A) Palampur (B) Nurpur
(C) Sujampur (D) Shahpur
88. At which place in Kangra District is a state of the Art Industrial Area being developed ?
- (A) Harchakian (B) Kandrori
(C) Indora (D) Fatehpur

89. Which of the following Watershed Development Projects is in Una District of H.P. ?

(A) Dhundan

(B) Saryanj Sarma

(C) Daseran

(D) Sidhchaler

90. Which of the following is the birthplace of film star Anupam Kher ?

(A) Manali

(B) Kullu

(C) Shimla

(D) Dalhousie

91. Who is the author of *Kashmir : The Vajpayee Years* ?

(A) K. V. Kamath

(B) A. S. Daulat

(C) Farooq Abdullah

(D) Ajit Doval

92. Who was the first Indian to win Victoria Cross ?

(A) Khudadad Khan

(B) Bhandari Ram

(C) Jamedar Lala

(D) Abdul Hamid

93. In which locality in Bhatinda (Punjab) was the venue from where martyr Bhagat Singh and his associates operated ?
- (A) Bhaggu Road (B) Maur Chowk
(C) Model Town (D) Toori Bazar
94. In the 2015 Delhi Vidhan Sabha elections, how many Congress candidates lost their security deposit ?
- (A) 54 (B) 57
(C) 62 (D) 66
95. With which game is L. Sarita Devi, who refused to accept her bronze medal at the Incheon Asian Games which led to one year ban on her, associated ?
- (A) Boxing (B) Wrestling
(C) Weight lifting (D) Hockey
96. To which country does Pia Alonzo Wurtzback, who was crowned Miss Universe 2015, belong ?
- (A) Columbia (B) USA
(C) Philippines (D) Thailand

97. Which country hosted the WTO Summit held during December 2015 ?
- (A) Egypt (B) Kenya
(C) Tanzania (D) Uganda
98. Which one of the following was inducted as Deputy Prime Minister of Nepal in October 2015 ?
- (A) Kamal Thapa (B) Ram Kumar Subba
(C) Satya Narayan Mandal (D) Agni Kharel
99. To which political party does Justin Trudeau who was sworn in as Prime Minister of Canada in November, 2015 belong ?
- (A) Conservative Party (B) Liberal Party
(C) Democratic Party (D) Socialist Party
100. Where did historic talks between the President of China and the President of Taiwan on 'one China' formation take place in November 2015 ?
- (A) Beijing (B) Taipei
(C) Singapore (D) Manila