

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: AU352

Course Name: COMPREHENSIVE EXAM (AU)

Max. Marks: 50

Duration: 1 Hour

Instructions

- (1) Each question carries one mark. No negative marks for wrong answers
- (2) Total number of questions: 50
- (3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
- (4) If more than one option is chosen, it will not be considered for valuation.
- (5) Calculators are not permitted

- 1 Sum of the perimeters of a circle and a square is 1. If sum of the area is least, then
 (A) Side of the square is double the radius of circle
 (B) Side of the square is 1/2 of the radius of the circle
 (C) Side of the square is equal to radius of the circle
 (D) None of these
- 2 One dimensional heat flow equation.
 A) $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$ C) $\frac{\partial^2 u}{\partial t^2} = c^2 \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} \right)$
 B) $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$ D) $\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} \right) = 0$
- 3 If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is
 (A) 30° (B) 60° (C) 90° (D) 120°
- 4 The angle which an inclined surface makes with horizontal when a body placed on it is on the point of moving down, is called
 A) Angle of repose B) Angle of friction
 C) Angle of inclination D) None of these
- 5 When the line is proportional to both HP and VP, we can get this true length in
 A) Front view B) Top view C) Both A & B D) Side view
- 6 In isometric projection the length or width of the object is drawn to the horizontal reference line.
 A) 90° B) 30° C) 45° D) 60°
- 7 Third largest solar energy produces in world?
 A) LIBIA B) CHINA C) INDIA D) JAPAN
- 8 Carbon footprint can be measured by
 A) Carbon dating B) Instruments C) Carbon accounting D) Formula
- 9 Concept of generating large quantities of ideas.
 A) Lateral thinking B) Critical thinking
 C) Brainstorming D) Creative thinking
- 10 First fully functional model of a design?
 A) Idea B) Design constrain C) Prototype D) Design constrain

- 11 The amount of front wheel tilt measured in degrees from the vertical, is called
A)camber angle B)caster angle C)toe-in D)toe-out
- 12 Four-wheel drive vehicles have differential at
A)front wheels B)rear wheels
C)both the front and rear wheelsD)any of the front or rear wheels
- 13 The component Transaxle is
A)Front drive axle B)Rear dead axle
C)Combined differential and gear boxD)Differential housing
- 14 The arrangement in which road springs act as torque and thrust members is known as
A) Hotchkiss driveB)Torque tube drive
C)road spring driveD)none of the above
- 15 The torque at the driving wheels gives rise to a propulsive force between wheels and road, known as
A)tractive forceB)driving effortC)braking thrustD)none of the above
- 16 In a 6x4 tandem axle drive, vehicle will have:
A) no drive axle B) two drive axles at front
C) one drive axle at rear D) two drive axles at rear
- 17 The transfer case is located next to the gearbox in:
A)Front wheel driveB)Rear wheel drive
C)Four wheel driveD)All of the above
- 18 Which type of clutch does not require clutch pedal?
A)Single plate B)Multi plate C)Centrifugal D)Cone
- 19 Which of the following is true?
A)high torque is required at the start of the vehicle
B)low torque is required at high speeds
C)gearbox helps in smooth running of vehicle
D)all of the above
- 20 The term DSG Stands for
A)Dual shift gear box B)Direct shift gear box
C)Double shift gear boxD)None of the above
- 21 The lubrication of gearbox is done with:
A)SAE 20W40 oil B)SAE 40 oil C)SAE 90 oil D)SAE 120 oil
- 22 The term ESP stands for:
A)Engine stability program B)Electronic stability program
C)Electronic starting pulseD)Engine starting power
- 23 In a five speed gear box the approximate gear ratio on over drive is :
A)3.76 : 1 B)1 : 1 C)1: 0.7 D)1 : 0.3
- 24 In a slider crank chain, the numbers of possible inversions are
A)Three B) Four C)Five D)Six
- 25 Which one of the following is a spring controlled centrifugal governor
A)Hartnell governor B) Porter governor
C)Proell governor D)Watt governor
- 26 Which one of the following is true for involute gears?
A)interference is inherently absent
B)variation in centre distance of shafts increases radial force
C)a convex flank is always in contact with concave flank

- D) pressure angle is constant throughout the teeth engagement
- 27 In spur gears, the circle on which the involute profile is generated is called the
A) base circle B) addendum circle C) pitch circle D) clearance circle
- 28 Types of gears used to connect two non-parallel non-intersecting shafts are
A) Spur gears B) Bevel gears C) Helical gears D) Spiral gears
- 29 The following one is an inversion of single slider crank chain
A) Watt's indicator mechanism B) Beam engine
C) Whitworth quick return motion mechanism D) Elliptical trammel
- 30 The relation between crank throw and stroke length is: <http://www.ktuonline.com>
A) Stroke length is half of crank throw B) Crank throw is half of Stroke length
C) Crank throw is double of Stroke length D) Stroke length is double of crank throw
- 31 The most preferred firing order of a six cylinder engine is:
A) 1-5-3-6-3-4 B) 1-2-4-5-6-3 C) 1-5-3-6-2-4 D) 1-6-2-4-3-5
- 32 The speed of cam shaft with respect to crank shaft is:
A) Same as the speed of crank shaft B) Double the speed of crank shaft
C) Half the speed of crank shaft D) One third the speed of crank shaft
- 33 The recommended percentage of oil for mist lubrication is:
A) 10% B) 8% C) 6% D) 3%
- 34 The term viscosity index refers to:
A) Measure of change of viscosity with respect to temperature
B) Measure of density rating with respect to temperature
C) Measure of change of temperature with respect to viscosity
D) Measure of change of specific gravity with respect to temperature.
- 35 The pulse width of a gasoline injector means:
A) The number of injection pulses in a second
B) The period on which the injector remain open
C) The number of pulses in an injection
D) The quantity of fuel injected in a stroke
- 36 The stoichiometric air fuel ratio of Hydro carbon fuel is :
A) 12.7: 1 B) 14.7: 1 C) 17.4: 1 D) 16.3: 1
- 37 Wobbe Index is a characteristic of :
A) Solid fuels B) Gaseous fuels C) Liquid fuels D) Fat Coal
- 38 Combustion reaction of fuels is a /an _____ reaction
A) Endothermic B) Auto Catalytic C) Exothermic D) None of the above
- 39 Presence of _____ in a dry gaseous fuel does not contribute to its calorific value.
A) hydrogen B) oxygen C) sulphur D) carbon
- 40 Which of the following gaseous fuels has the lowest calorific value?
A) Gobar gas B) Refinery gas C) Converter gas D) Blast furnace gas

- 41 For every 10% increase in the excess air; the fuel consumption increases by _____ percent.
A)10 B)1 C)0.1 D)2
- 42 The specific fuel consumption per BHP hour for a conventional Diesel engine is:
A)0.15 kg B)0.2 kg C)0.25 kg D)0.3 kg
- 43 The probability of knocking in diesel engines is increased by
A)High self ignition temperature B)Low volatility
C)Higher viscosity D)All of the above
- 44 PDI is the short form of
A)Programmed direct injection B)Particular degree injection
C)Pre-delivery inspection D)Pre-diagnose inspection
- 45 Which of the following creates a flapping sound near the front of the engine?
A)Timing belt tension too tight B)Drive belt too tight
C)Drive belt too loose D)Timing belt tension too loose
- 46 All model year passenger cars and light trucks are OBDII-equipped from the year
A)2010 B)2006 C)1999 D)1996
- 47 The DLC used in OBD II compliance vehicles refers to:
A)Direct link connector B)Data Log connector
C)Data link connector D)Diagnostic link connector
- 48 Hot soak is a problem seen in some carburetted vehicles due to
A)Improper tuning B)Overflowing
C)Vapour lock D)Mis-firing
- 49 If you observe presence of lubrication oil in the coolant, it is a symptom of:
A)Blown out radiator B)Blown out lube oil pump
C)Blown out head gasket D)Blown out exhaust valve
- 50 The "Stroboscope" is an equipment used to check:
A)Engine vibration B)Valve timing
C)Ignition timing D)Engine ECU

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