Exit Exam Model For Mechanical Engineering Department, Mattu University, April 28, 2023

Attempt all questions

1

Full Name

Enter your answer

2

Id No.

Enter your answer

3

Which of the following functional division/sphere of activities of materials handling covers the handling of formed materials in the initial, intermediate and final stages of manufacture in manufacturing Operations?
(1 Point)

- ◯ Carrier Handling
- ◯ Packaging
- ◯ Bulk handling
- ◯ Unit handling

4

Which one of the following principles of materials handling is used to Integrate those handling and storage activities which are economically viable into a coordinated system of operation including receiving, inspection, storage, production, assembly, packaging, warehousing, shipping and transportation? (1 Point)

- ◯ Ergonomic Principle
- ◯ Flexibility Principle
- ◯ Systems Principle
- ◯ Obsolescence Principle

5

Which one of the following principal technical factors is not use for the proper choice of types of Materials Handling Equipment? (1 Point)

- ◯ Kinds and properties of load to be handled
- ◯ Methods of stacking loads at the initial, intermediate and final points
- ◯ Characteristics of production process involved in moving loads
- ◯ Consideration of specific local conditions

- ◯ None

6

Which of the followings is not the benefit of good materials handling system? (1 Point)

- ◯ Reduce waste by Eliminating damage to materials during the handling process.
- ◯ Reduce cost by increasing productivity
- ◯ Improve working conditions by increasing workers' fatigue
- ◯ Improve the efficiency of the plant by Providing a better organization of storage facilities
- ◯ Reduce cost by Utilizing space to better advantage

7

Which of the followings is not the essential requirements of a good materials handling system (1 Point)

- ◯ Efficient and safe movement of materials to the desired place
- ◯ Supply of materials at the desired rate
- ◯ Storing of materials utilizing maximum space
- ◯ lowest cost solution to the materials handling activities
- ◯ all

8

From the following types of oscillating conveyors, which one is used for medium duty application? (1 Point)

- Torq-mount Oscillating Conveyor
- Coil-mount Oscillating Conveyor
- Flex-mount Oscillating Conveyors
- speed-mount Oscillating Conveyors
- None

9

Which one of the following drive is used for hanging the speed of the driven shaft while the main or driving shaft runs at constant speed? (1 Point)

- Stepped or cone pulleys belt drive
- Compound belt drive
- Crossed or twist belt drive
- Open belt drive

10

_____is used to hold the load being lifted without interfering in the hoisting process but preventing the load from coming down due to gravity. (1 Point)

- Brakes
- Arresting gear
- Hoisting gear
- Traveling gear

11

Which one of the following is **not** true about governor? (1 Point)

- Regulate the supply of driving fluid producing energy
- It is provide on prime movers such as engines and turbines.
- It takes care of fluctuation of speed due to variation of load.
- It works continuously from cycle to cycle

12

Which one of the following is **not** the cause of vibration? (1 Point)

- Lack of balancing
- Loose Fitting
- Correct alignment
- Lack of isolation

13

Which one of the following mechanism is widely used to produce desired vibrations? (1 Point)

- Toggle mechanisms
- Quick-return mechanism
- Scotch yoke mechanism
- Geneva mechanism

14

Which one is not the characteristics of a good fuel? (1 Point)

- The fuel should not pollute the air by burn completely without leaving any solid or gaseous residue
- The fuel should have low calorific value
- The fuel should be cheap and readily available
- The fuel should be easy to store and transport

15

Which order is the firing order for 6-cylinder engine? (1 Point)

- 1 2 3 4 5 6
- 1 5 3 6 2 4

- ◯ 1 3 4 6 5 2
- ◯ 2 3 5 4 2 6

16

According to the Dalton's law of partial pressures, the total pressure of a mixture of ideal gases is equal to the (1 Point)

- ◯ difference of the highest and lowest pressure
- ◯ product of the partial pressures
- ◯ sum of the partial pressures
- ◯ none of the mentioned

17

Which one is the component needed for an Engine to run? (1 Point)

- ◯ Ignition Source
- ◯ Fuel
- ◯ Oxygen
- ◯ all

18

Which one of the following is not similarity between heat and work? (1 Point)

- ◯ Both are recognized at the boundaries of a system as they cross the boundaries
- ◯ Systems possess energy, but not heat or work
- ◯ Both are associated with a process, not a state
- ◯ Heat is point function whereas work path independent

19

Brake specific fuel consumption as a function of engine speed and displacement. Which one is correct about above statement. (1 Point)

- ◯ Specific fuel consumption decreases as engine speed increases due to the shorter time for heat loss
- ◯ At higher engine speeds fuel consumption again increases because of high friction losses
- ◯ As compression ratio is increased fuel consumption decreases due to greater thermal efficiency
- ◯ All are answer

20

Isooctane is burned with 120% theoretical air in a small four-cylinder supercharged automobile engine. Choice the best answer based on below combustion reaction, where is equivalence ratio. (1 Point)

$$C_8H_{18} + 15O_2 + 15(3.76)N_2 \rightarrow 8CO_2 + 9H_2O + 15(3.76)N_2 + 2.5O_2$$

- ◯ $\phi > 1$ *running lean because oxygen in exhaust*

- $\phi > 1$ *running rich because CO and fuel in exhaust*
- $\phi < 1$ *running lean because oxygen in exhaust*
- $\phi = 1$ *stoichiometric because* max *imum energy released from fuel*

21

Energy can be transferred to or from a system in the form of ---------- (1 Point)

- Heat
- Mass
- work
- all
- None

22

If all the variables of a stream are independent of time it is said to be in_____- (1 Point)

- steady flow
- unsteady flow
- uniform flow
- closed flow

23

A good lubricant should be _____. (1 Point)

- Not change its stats with change in temperature
- Free from corrosive acids
- Remove maximum amount of heat from engine components
- all are answer

24

Which of the following is the Kelvin Planck statement? (1 Point)

- Heat from a cold reservoir cannot be transferred to a hot reservoir without external work
- Efficiency for a reversible cyclic process can be 1
- Heat from a hot reservoir can be completely converted into work if process is reversible
- Efficiency of a heat engine is less than 1

25

Which one of the following equations represents the cyclic process according to 1st law of Thermodynamics? (1 Point)

- $\Delta Q = \Delta U + W$
- $\Delta Q - W = -\Delta U$

- ΔU= W-ΔQ
- ΔQ= W

26

The food compartment of a refrigerator is maintained at 4°C by removing heat from it at a rate of 360 kJ/min. If the required power input to the refrigerator is 2kW, determine the coefficient of performance of the refrigerator. (1 Point)

- 4
- 3
- 2
- 1

27

Which one of the following statement is incorrect? (1 Point)

- Entropy is a non-conserved property
- The entropy of a pure crystalline substance at zero temperature is zero.
- Entropy is associated with energy transfer as work
- For an internally reversible adiabatic closed system process change of entropy is zero

28

The maximum useful work out obtainable from a certain heat input in a cyclic heat engine is called the _____ (1 Point)

- ◯ Kinetic energy
- ◯ unavailable energy
- ◯ electrical energy
- ◯ available energy

29

Which of the following is not true about fluid mechanics? (1 Point)

- ◯ Deforms a fixed amount or breaks completely when a stress is applied.
- ◯ Deforms continuously as long as any shear stress is applied.
- ◯ In case of gases, the viscosity will increase with temperature because of molecular collision increases
- ◯ Pascal's Principle states that "If an external pressure is applied to a confined fluid, the pressure at every point within the fluid increases by that amount.

30

What does the term surface tension mean? (1 Point)

- ◯ Internal resistance offered by one layer of fluid to the adjacent layer.
- ◯ Ratio of dynamic viscosity to density
- ◯ The magnitude of attractive forces between molecules per unit length
- ◯ The variation of pressure in vertical direction in a fluid is directly proportional to specific weight.

31

What did you notice about boundary layer thickness? (1 Point)

- It is defined as the distance y from the surface at which u = 0.99V.
- The region from the pipe inlet to the point at which the boundary layer merges at the centerline.
- The region beyond the entrance region in which the velocity profile is fully developed and remains unchanged
- Is usually taken to be the distance from the pipe entrance to where the wall shear stress (and thus the friction factor) reaches within about 2 percent of the fully developed value.

32

Which of the following is false? (1 Point)

- The head loss represents the additional height that the fluid needs to be raised by a pump in order to overcome the frictional losses in the pipe.
- The required pumping power is not proportional to the length of the pipe and the viscosity of the fluid
- The velocity profile in fully developed pipe flow is parabolic in laminar flow, but much fuller in turbulent flow.
- Pressure drop due to viscous effects represents an irreversible pressure loss

33

Which one of the following is the term in which the differences between positive-displacement machines and turbomachine are given by? (1 Point)

- ◯ modes of action
- ◯ operation and energy transfer
- ◯ mechanical Efficiency
- ◯ None

34

A speed of geometrically similar machines discharging one cubic meter per second of water under head of one meter is? (1 Point)

- ◯ Significant speed
- ◯ machine speed
- ◯ Specific speed
- ◯ Dynamic speed

35

The state for the flowing fluid refers to those properties like pressure, temperature, density is called? (1 Point)

- ◯ Static state
- ◯ Stagnation state
- ◯ Fluid state

- ◯ Dynamic state

36

The degree of reaction is a parameter which describes the relation between? (1 Point)

- ◯ Heat Transfer
- ◯ Energy Transfer
- ◯ energy available
- ◯ Mass Transfer

37

Which one of the following is the energy absorbed during the fracture of a material, as measured by the area under the entire engineering stress-strain curve? (1 Point)

- ◯ Modulus of resilience
- ◯ Yield strength
- ◯ Toughness
- ◯ Tensile strength

38

One of the following equipment is used to test the material's resistance to localized plastic deformation. (1 Point)

- ◯ Charpy impact test machine
- ◯ Tensile test machine
- ◯ Rockwell hardness machine
- ◯ Fatigue testing machine

39

Which one of the following **is not** the mechanisms of strengthening in metals? (1 Point)

- ◯ Solid-Solid solution
- ◯ Strain hardening
- ◯ Dislocation
- ◯ All

40

Which one of the following measures may not be taken to extend fatigue life of the material? (1 Point)

- ◯ Reducing the mean stress level
- ◯ Eliminating sharp surface discontinuities
- ◯ Case hardening by using a carburizing or nitriding process
- ◯ None

41

Which one the following is true concerning the main objective of normalising heat treatment processes commonly employed in engineering practice (1 Point)

- To soften the steel so that it may be easily machined or cold worked
- To increase the hardness of the metal so that it can resist wear
- To remove dislocations caused in the internal structure of the steel due to hot working
- To reduce brittleness of the hardened steel and thus to increase ductility

42

In casting, total solidification time is defined as which one of the following (1 Point)

- time between pouring and complete solidification
- time between pouring and cooling to room temperature
- time between solidification and cooling to room temperature
- time to give up the heat of fusion

43

A misrun is which one of the following defects in casting (1 Point)

- globules of metal becoming entrapped in the casting
- metal is not properly poured into the down sprue

- metal solidifies before filling the cavity
- micro porosity

44

Which one of the following processes or processing steps is not applicable in glass working (1 Point)

- annealing
- pressing
- quenching
- sintering

45

Which of the following geometric features should be avoided if possible, in the design of structural components made of new ceramics (1 Point)

- deep holes
- rounded inside corners
- thick sections

46

Which of the following are advantages and characteristics of hot working relative to cold working (1 Point)

- fracture of work part is less likely
- increased strength properties
- more overall energy is required

47

Spring back in a sheet-metal-bending operation is the result of which one of the following (1 Point)

- elastic recovery of the metal
- overbending
- overstraining
- yield strength of the metal

48

If the cutting conditions in a turning operation are cutting speed = 300 ft/min, feed = 0.010 in/rev, and depth of cut = 0.100 in, which one of the following is the material removal rate? (1 Point)

- $0.025\ in^3 / \min$
- $0.3\ in^3 / \min$
- $3.0\ in^3 / \min$
- $3.6\ in^3 / \min$

49

A roughing operation generally involves one of the following combinations of cutting conditions where v =cutting speed, f = feed, and d = depth. (1 Point)

- high v, f, and d
- high v, low f and d
- low v, high f and d
- low v, f, and d

50

Which of the following statement is correct?
(1 Point)

- In counter heat exchangers, fluids enter the and leave at perpendicular ends
- In double pipe heat exchangers, one pipe is fixed concentrically inside a larger pipe
- In cross flow heat exchangers, fluid flow is in the same direction
- In parallel flow heat exchangers, fluid enters and leave at opposite ends

51

In which mode, the rate of heat transfer is maximum (1 Point)

- Conduction
- Convection

- ◯ Radiation
- ◯ In all, heat is transferred with the same speed

52

The main purpose of using extended surfaces (fins) in intercooler is to reduce..... (1 Point)

- ◯ Pressure
- ◯ Volume
- ◯ Temperature
- ◯ Entropy

53

Which one of the following **is not** advantage of stress transformation? (1 Point)

- ◯ To know principal and maximum shear stresses
- ◯ To know direction of maximum stresses
- ◯ To know maximum tensile and compressive stresses
- ◯ All

54

One of the following failure criteria **is not** appropriate for ductile materials (1 Point)

- ◯ Maximum Shearing Stress Theory
- ◯ Maximum Normal Stress Theory
- ◯ Maximum Distortion Energy Theory (Von-Mises Criterion)
- ◯ None

55

In solving deflection and slopes of beams one of the following methods **is the most appropriate** when number of segments/sections of the beam is numerous (many). (1 Point)

- ◯ Second Integration of Bending Moment Equations
- ◯ Castigliano's method /Energy Method
- ◯ Moment area method
- ◯ All

56

Unsymmetrical Bending can occur when (1 Point)

- ◯ Cross sections of the beams are not symmetric
- ◯ Cross sections of the beam are symmetric but the loading is not in the direction of symmetry
- ◯ All

57

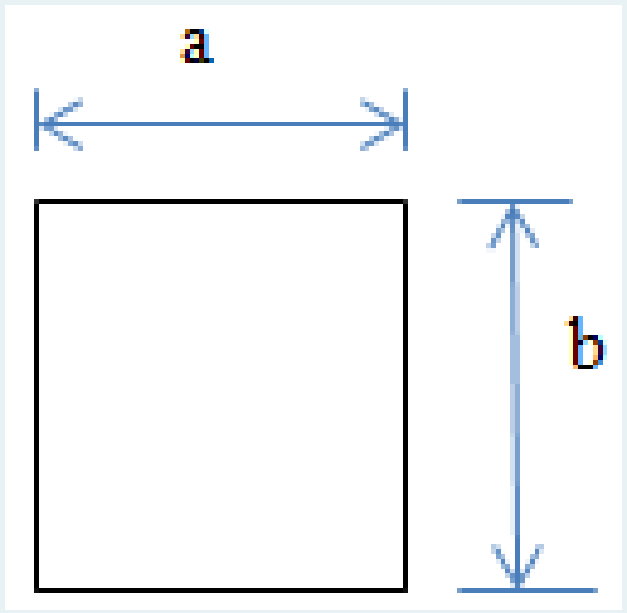
Orientation of Neutral axis is important (1 Point)

- To identify direction of tensile and compressive stresses
- To locate maximum torsional shear stress
- To locate value of any torsional shear stress
- To locate maximum value of normal stress under point axial loading

58

For rectangular member of shown cross section as subjected to torsion, where does maximum shearing stress occur for **side b** is greater to **side a**.

(1 Point)



- At mid of side a
- At all corners
- At center of the section
- At mid of side b

59

One of the following describe characteristic property of a material (1 Point)

- Failure theory
- Second moment of area
- Stress strain diagram
- Section modulus

60

The stress in the bar when load is applied suddenly is .....as compared to the stress induced due to gradually applied load. (1 Point)

- Same
- Three times
- double
- Four times

61

At the neutral axis of a beam, the shear stress is
(1 Point)

- Zero
- maximum

- minimum

62

In static loading, stress concentration is more serious in
(1 Point)

- Brittle materials
- Ductile materials
- Brittle as well as ductile materials
- Elastic materials

63

Which type of machine element serves a reservoir which stores energy during the period when supply of energy is more than the requirement and releases it during the period when the requirement of energy is more than the supply?
(1 Point)

- Springs
- Flywheel
- Rotor
- Pulley

64

Which one could not be the cause of stress concentration? (1 Point)

- ◯ Localized loading
- ◯ Variation in the material properties
- ◯ Fine surface finish
- ◯ Abrupt Change of characteristics

65

A bolt of M 24 × 2 means that (1 Point)

- ◯ The pitch of the thread is 24 mm and depth is 2 mm
- ◯ The nominal diameter of bolt is 24 mm and the pitch is 2 mm
- ◯ The cross-sectional area of the threads is 24 mm2
- ◯ The effective diameter of the bolt is 24 mm and there are two threads per cm

66

The uniform wear theory of disc clutches states that:
(1 Point)

- ◯ Pressure is proportional to the velocity of sliding
- ◯ Pressure is inversely proportional to radius
- ◯ Frictional force per unit area is uniform all over the disc surface.
- ◯ The mating component in clutch is new

67

What type of energy conversion does a piezoelectric transducer perform?
(1 Point)

- It converts mechanical energy to sound energy
- It converts sound energy to mechanical energy
- It converts mechanical energy to electrical energy
- It converts electrical energy to mechanical energy

68

From the following types of sensor which one is different?
(1 Point)

- Thermocouples
- RTD
- Thermistors
- Photoresistor

69

Which of the following is not true about mechatronic design approach?
(1 Point)

- Also called concurrent approach
- Also called sequential design approach

- ◯ It uses hybrid components
- ◯ More complexity and Flexible control

70

The main function of Actuator is _____
(1 Point)

- ◯ To produces a change in the physical system by generating motion
- ◯ To detect input, consist of additional components such as filters,
- ◯ To converts mechanical energy to electrical energy
- ◯ To detect the state of the system position

71

Where is the feedback generated by sensors in a mechatronics system given?
(1 Point)

- ◯ Input sensors
- ◯ Comparators
- ◯ Mechanical actuators
- ◯ Output sensors

72

What are the applications of PLC in mechatronics?
(1 Point)

- Timing, counting, logic, arithmetic and sequencing
- Managing, commanding and directing
- Storing data
- Processing

73

Which is the first aspect which needs to be considered in the Mechatronics design
process?
(1 Point)

- Hardware design and simulation
- Prototype development
- Mathematical modelling
- Modelling and simulation

74

In what order do managers typically perform the managerial function?
(1 Point)

- Organizing, Planning, Controlling, Leading

- ◯ Planning, Organizing, Leading, Controlling
- ◯ Organizing, Leading, Planning, Controlling
- ◯ Planning, Organizing, Controlling, Leading

75

At what level of an organization does a corporate manager operate? (1 Point)

- ◯ Functional
- ◯ Operational
- ◯ Middle level
- ◯ Top level

76

Which one is not a recognized key skill of management?
(1 Point)

- ◯ Conceptual skills
- ◯ Human skills
- ◯ Technical skills
- ◯ Writing skills

77

Which of the following plant layout refers to arranging all the processing equipment and machines as per the sequence of operations of a product? (1 Point)

- Fixed position layout
- Process layout
- Combination layout
- Product layout

78

Which of the following is not a forecasting technique? (1 Point)

- Judgmental
- Time Series
- Time horizon
- Associative

79

In which of the following forecasting technique, data obtained from past experience is analysed? (1 Point)

- Judgmental forecast
- Time series forecast

- ◯ Associative model
- ◯ All of the above

80

_____ is the systematic use of techniques that identify a required function, establish a value for that function, and finally provide the function at the lowest overall cost.
(1 Point)

- ◯ Functional analysis
- ◯ Value analysis
- ◯ Functional specification
- ◯ None of the above

81

The need or the significance of Measurements are for _____
(1 Point)

- ◯ Research activities
- ◯ Automatic control of the system
- ◯ Performance of the plant
- ◯ All of the above

82

Strain energy is the
(1 Point)

- Energy stored in a body when strained within elastic limits
- Energy stored in a body when strained up to the breaking of a specimen
- Maximum strain energy which can be stored in a body
- Proof resilience per unit volume of a material