



Maratha Vidya Prasarak Samaj's

**Rajarshi Shahu Maharaj Polytechnic, Nashik**

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.

Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.



**RSM POLY**

# SYLLABUS

Chapter No.	Name of chapter	Marks
1	Recent Trends in Automobile Industry	20
2	Process Engineering	10
3	Recent Trends in Manufacturing Industry	20
4	Energy Audit and Managment	10
5	Agricultural Equipment and Post Harvest Technology	10
Total Marks :-		70

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# CLASS TEST - I PAPER PATTERN

## Syllabus:-

Unit No.	Name of the Unit	Course Outcome (CO)
1	Recent Trends in Automobile Industry	CO-652.01
2	Process Engineering	CO-652.02
3	Recent Trends in Manufacturing Industry	CO-652.03

Q.1	Objective Multiple Choice Questions 40*0.5=20 Marks	Course Outcome (CO)
a)	Recent Trends in Automobile Industry	CO-652.01
b)	Process Engineering	CO-652.02
c)	Recent Trends in Manufacturing Industry	CO-652.03

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# CLASS TEST - II

## PAPER PATTERN

### Syllabus:-

Unit No.	Name of the Unit	Course Outcome (CO)
4	Recent Trends in Manufacturing Industry	CO-652.03
5	Energy Audit and Management	CO-652.04
6	Agricultural Equipment and Post Harvest Technology	CO-652.05

Q.1	Objective Multiple Choice Questions 40*0.5=20 Marks	Course Outcome (CO)
a)	Recent Trends in Manufacturing Industry	CO-652.03
b)	Energy Audit and Management	CO-652.04
c)	Agricultural Equipment and Post Harvest Technology	CO-652.05

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## **UNIT-1. RECENT TRENDS IN AUTOMOBILE ENDUSRTY**

1-The compression ratio for practically diesel engine lies usually in the range of

- (a) 3-5
- (b) 6-8
- (c) 10-15
- (d) 16-22

2-A four stroke petrol engine theoretically operates on

- (a) Otto cycle
- (b) Brayton cycle
- (c) Joule cycle
- (d) Bell Coleman cycle

3-BHP of an engine is determined by a formula

- (a)  $2\pi NT / 4500$
- (b)  $4\pi NT / 4500$
- (c)  $\pi NT / 4500$
- (d)  $2\pi RNT / 4500$

4-The radiator tubes are manufactured from

- (a) Cast iron
- (b) Aluminium
- (c) Brass
- (d) Steel

5-Which of the following is not the effect of detonation?

- (a) High operating temperature
- (b) Loss in efficiency and power output
- (c) Loud and pulsating noise
- (d) High local stresses



6-The brake shoes are curved to conform to the inner diameter of the

- (a) Tyre
- (b) Wheel
- (c) Pedal
- (d) Brake drum

7-The material used for the piston of the modern cars is

- (a) Brass
- (b) Cast Iron
- (c) Aluminium alloy
- (d) Steel

8-IHP minus FHP is equal to

- (a) BHP
- (b) SAF HP
- (c) m.e.p
- (d) None of the above

9-In a petrol engine the tendency for knocking decreases with

- (a) increase in charge temperature
- (b) increase in cylinder size
- (c) increase in compression ratio
- (d) increase in delay period

10.The motion of the cam is transferred to the valves through

- A. pistons
- B. rocker arms
- C. camshaft pulley
- D. valve stems

11.Which of the following symptom is caused as a result of brake disc run out ?

- A. Ineffectiveness of the brakes
- B. Judder during braking

- C. Localized wearing of the brake pads
- D. Rapid wearing of the brake pads
12. The condition that causes vapour locking in a brake system is
- A. overheating of the fluid due to frequent brake application
- B. overcooling of the brakes during high speed driving
- C. keeping the vehicle without use for an extended period
- D. an excessively high engine speed on a downhill road
13. The portion of a crankshaft which rests on cylinder block is called main journal.
- A. Yes
- B. No
14. If the valve clearances are excessively large, the problem that can arise is
- A. overheating of the engine
- B. incomplete valve closure
- C. fouling of spark plug by gasoline
- D. none of these
15. The power source for a brake booster is
- A. exhaust manifold pressure
- B. electricity
- C. the pressure difference between the atmospheric pressure and the vacuum pressure in the intake manifold
- D. hydraulic pump
16. The specific gravity of acid in a fully charged battery is generally
- A. 1.00
- B. 1.28
- C. 1.82
- D. 2.81
17. brake pedal during ABS operation
- A. is pushed upward forcefully



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- B. pedal stroke becomes longer
- C. transmits slight kickback to the driver's foot
- D. all of the above



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## UNIT- 2. PROCESS ENGINEERING

1. 1.A safety valve usually employed with stationary boilers is
  - a. Lever safety valve
  - b. Dead weight safety valve
  - c. High steam and low water safety valve
  - d. All of these
2. The relative heat absorption for successively added equal areas of boiler convection heating surfaces
  - a. Increases
  - b. Decreases
  - c. Remain unaffected
  - d. First increases and then decreases
3. The pressure of steam in the engine cylinder at the beginning of the stroke is \_\_\_\_\_ the boiler pressure.
  - a. Equal to
  - b. Less than
  - c. Higher than
  - d. None of these
5. Adiabatic process is
  - e. Essentially an isentropic process
  - f. Non-heat transfer process
  - g. Reversible process
  - h. Constant temperature process
6. Lancashire boiler is
  - i. Stationary fire tube boiler
  - j. Internally fired boiler
  - k. Horizontal boiler
  - l. All of these
7. Cochran boiler is a
  - m. Horizontal fire tube boiler
  - n. Horizontal water tube boiler
  - o. Vertical water tube boiler

- p. Vertical fire tube boiler
8. Blow off cock in a boiler is used to
- q. Control the flow of steam from the boiler to the main pipe and to shut off the steam completely when required
  - r. Empty the boiler when required and to discharge the mud, scale or sediments which are accumulated at the bottom of the boiler
  - s. Put off fire in the furnace of the boiler when the level of water in the boiler falls to an unsafe limit
  - t. Increase the temperature of saturated steam without raising its pressure
9. The diameter of internal flue tubes in a Lancashire boiler compared to its shell is
- u. One-half
  - v. One-third
  - w. Two-fourth
  - x. Two-fifth
10. When the circulation of water, in a boiler, is by convection currents which are set up during the heating of water, then the boiler is known as
- y. Internally fired boiler
  - z. Externally fired boiler
  - aa. Natural circulation boiler
  - bb. Forced circulation boiler
11. Thermal efficiency of a thermal power plant is of the order of
- cc. 15 %
  - dd. 20 %
  - ee. 30 %
  - ff. 45 %
12. The high steam and low water safety valve is not used in
- gg. Cochran boiler
  - hh. Cornish boiler
  - ii. Lancashire boiler
  - jj. Locomotive boiler
13. Expanding steam to a very low pressure (high vacuum) in steam engines is
- kk. Desirable
  - ll. Economical

- mm. Essential
- nn. Uneconomical

14. The cylinder dimensions of a compound engine may be designed on the basis of

- oo. Equal power developed in each cylinder for uniform turning moment
- pp. Equal initial piston loads on all pistons for obtaining same size of piston rod, connecting rod etc. for all cylinders
- qq. Equal temperature drop in each cylinder for economy of steam
- rr. All of the above

15. One kilowatt-hour energy is equivalent to

- ss. 1000 J
- tt. 360 kJ
- uu. 3600 kJ
- vv. 3600 kW/sec

16. In a reaction turbine when the degree of reaction is zero, then there is

- ww. No heat drop in moving blades
- xx. No heat drop in fixed blades
- yy. Maximum heat drop in moving blades
- zz. Maximum heat drop in fixed blades

17. A vessel into which the steam is exhausted and condensed after doing work in an engine cylinder or turbine is known as

- aaa. Steam condenser
- bbb. Steam boiler
- ccc. Steam preheater
- ddd. Economiser

18. The capacity of induced draft fan compared to forced draft fan in a boiler is

- eee. Same
- fff. More
- ggg. Less
- hhh. Less or more depending on size of boiler

19. The expansion of steam in a nozzle follows

- iii. Carnot cycle
- jjj. Rankine cycle
- kkk. Joule cycle

III. Stirling cycle

20. Which of the following compound steam engine requires a smaller flywheel?

- mmm. Receiver type
- nnn. Tandem type
- ooo. Woolf type
- ppp. All of these

21. The feed check valve is used in order to

- qqq. Regulate flow of boiler water
- rrr. Check level of water in boiler drum
- sss. Recirculate unwanted feed water

ttt. Allow high pressure feed water to flow to drum and not allow reverse flow to take place

22. The discharge of steam in a convergent-divergent nozzle \_\_\_\_\_ after the throat (i.e. in the divergent portion of the nozzle)

- uuu. Remains constant
- vvv. Decreases
- www. Increases
- xxx. None of these

23. An economiser \_\_\_\_\_ the steam raising capacity of a boiler.

- yyy. Increases
- zzz. Decreases
- aaa. Has no effect on
- bbb. None of these

24. 1 kg.m is equal to

- ccc. 9.81 Joules
- ddd. 102 Joules
- eee. 427 Joules
- fff. None of these

25. When the back pressure of a nozzle is below the designed value of pressure at exit of nozzle, the nozzle is said to be

- gggg. Choked
- hhhh. Under-damping
- iiii. Over-damping
- jjjj. None of these

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### UNIT- 3. RECENT TRENDS IN MANUFACTURING INDUSTRY

1. The temperature range for soldering process is.....

- A.40oC to 100oC
- B.180oC to 250oC
- C.300oC to 500oC
- D.600oC to 900oC
- E.1000oC to 2000oC

2. A soldering iron 'bit' is made of.....

- A.Brass
- B.Tin
- C.Steel
- D.Copper

3. Heat for soldering process is supplied by.....

- A.Soldering iron
- B.Induction furnace
- C.Electric resistance method
- D.Any of the above

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4. Soldering iron is made of wedge shape in order to.....

- A. Apply high pressure at edge
- B. Retain heat
- C. Retain solder
- D. Forge welding
- E. Arc welding

5. The purpose of using flux in soldering is to.....

- A. Increase fluidity of solder metal
- B. Fill up gaps left in a bad joint
- C. Carbon steel
- D. Prevent oxides forming
- E. Wash away surplus solder

6. Brazing is the process of.....

- A. Joining plastic sheets
- B. Hard soldering using brass spelter
- C. Casing in brass
- D. Making steel look like brass
- E. Any of the above

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7. The commonly used flux for brazing is.....

- A. Resin
- B.  $\text{NH}_4\text{Cl}$
- C. Borax
- D. Soft iron

8. The temperature range of brazing process is.....

- A.  $150^\circ\text{C}$  to  $250^\circ\text{C}$
- B.  $250^\circ\text{C}$  to  $450^\circ\text{C}$
- C.  $500^\circ\text{C}$  to  $700^\circ\text{C}$
- D.  $700^\circ\text{C}$  to  $900^\circ\text{C}$
- E.  $1000^\circ\text{C}$  to  $2000^\circ\text{C}$

9. The purpose of using borax in brazing is to.....

- A. Replace flux
- B. Dissolve oxides when heating the work
- C. Accelerate the formation of oxides on the work
- D. Prevent the spelter from melting too quickly
- E. Increase the fluidity of brazing process

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10. The flux in brazing process is used in the form of.....

- A. Powder
- B. Liquid
- C. Paste
- D. Any of the above
- E. None of the above

Entrapped fluxes, during brazing result in.....

- A. Presence of gas pockets
- B. Corrosion
- C. Cracking
- D. Distortion of joints
- E. Erosion

12. Which of the following flux is used for brazing aluminium and magnesium.....

- A. Mixture of boric acid, borax and wetting agent
- B. Boric acid, borax or fluoride with a wetting agent
- C. Chlorides and fluorides mixed with water
- D. Any of the above

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13. When brazing is carried out.....

- A. A joint is made between two parts by molten spelter
- B. The edges of the joint melt and run together
- C. Spelter forms an alloy with the flux
- D. Flux prevents the work from melting
- E. Flux acts as a cementing material

14. Spelter is same as.....

- A. Tin
- B. Zinc
- C. Lead
- D. Silver
- E. Brass

15. A braze joint may be satisfactorily used on components made of.....

- A. Tinplate
- B. Brass
- C. Copper
- D. Aluminium
- E. None of the above

16. In sand moulding, the middle part of flask is called.....

- A. Cope
- B. Cheek
- C. Drag
- D. Flask-middle
- E. Any of the above

17. In sand moulding the bottom most part of the flask is called.....

- A. Cope
- B. Cheek
- C. Drag
- D. Flask bottom

18. In which type of moulding, cow dung is sometimes used.....

- A. Bench moulding
- B. Dry sand moulding
- C. Green sand moulding
- D. All of the above
- E. None of the above

19. The main advantage of shell moulding is that.....

- A. A metallic pattern is used
- B. The moulds are stronger
- C. Thin section can be easily obtained
- D. Highly complex sections can be easily obtained
- E. High production rate is possible

20. Following moulding machine is used to get uniform sand hardness.....

- A. Jolt
- B. Sand slinger
- C. Squeezing
- D. Diaphragm moulding
- E. None of the above

## UNIT- 4. ENERGY AUDIT AND MANAGEMENT

1. “The judicious and effective use of energy to maximise profits and enhance competitive positions”.

This can be the definition of:

- a) Energy conservation
- b) Energy management
- c) Energy policy
- d) Energy Audit

2. The energy management function is generally vested in –

- (a) Senior Management
- (b) One energy manager or co-ordinator
- (c) Distributed among number of middle manager
- (d) (b) & (c) together

3. The objective of energy management includes

- a) Minimising energy costs
- b) Minimising waste
- c) Minimising environmental degradation
- d) All the above

4. The ratio of current year's production to the reference year's production is called as

- a) Demand factor
- b) Production factor
- c) Utilisation factor
- d) Load factor

5. Replacement of steam based hot water generation by solar system is an example of

- a) Matching energy usage to the requirement
- b) Maximising system efficiency

- c) Energy substitution
- d) Performance improvement
6. One unit of electricity is equivalent to \_\_\_\_ kcal heat units.
- a) 800
- b) 860
- c) 400
- d) 680
7. The benchmarking parameter for air conditioning equipment is
- a) kW/Ton of Refrigeration
- b) kW/ kg of refrigerant handled
- c) kcal/m<sup>3</sup> of chilled water
- d) Differential temperature across chiller
8. The percentage of energy saved at the current rate of use, compared to the reference year rate of use, is called
- a) Energy Utilization
- b) Energy Performance
- c) Energy Efficiency
- d) None
9. Which instrument is used to monitor O<sub>2</sub>, CO in flue gas? (EA)
- a) Combustion analyzer
- b) Power analyzer
- c) Pyrometer
- d) Fyrite
10. Lux meter is used to measure.....
- a) Illumination level
- b) Sound intensity and illumination level

c) Harmonics

d) Speed

11. For a cement plant the parameter, “kWh/MT of clinker “indicates

a) Energy Index parameter

b) Utility factor

c) Production factor

d) Load factor

12. Energy manger should be well versed with

a) Manufacturing and processing skills

b) Managerial and technical skills

c) Technical and marketing skills

d) Managerial and commercial skills

13. An energy policy does not include

a) Target energy consumption reduction

b) Time period for reduction

c) Declaration of top management commitment

d) Future production projection

14. CO<sub>2</sub> measurement of Fyrite kit is based on

a) Weight basis (dry)

b) Volume basis (dry)

c) Weight basis (wet)

d) Volume basis (wet)

15. Non-contact speed measurements can be carried out by

a) Tachometer

b) Stroboscope

c) Oscilloscope

d) Speedometer

16. The tool used for performance assessment and logical evaluation of avenues for improvement in Energy management and audit is

- a) Fuel substitution
- b) Monitoring and verification
- c) Energy pricing
- d) Bench marking

17. Infrared thermometer is used to measure

- a) Surface temperature
- b) Flame temperature
- c) Flue gas temperature
- d) Hot water temperature

18. Find out the 'odd' among the following choices for fuel substitution for industrial sector of India.

- a) LDO with LSHS
- b) Coal with rice husk
- c) Natural gas for fertilizer plant
- d) LPG for soft coke

19. The various types of the instruments, which requires during audit need to be

- a) Easy to carry
- b) Easy to operate
- c) Inexpensive
- d) All (a) to (c)

20. Air velocity in ducts can be measured by using \_\_\_\_ and manometer

- a) Orifice meter
- b) Borden gauge

- c) Pitot tube
- d) Anemometer



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## **UNIT- 5. AGRICULTURAL EQUIPMENT AND POST HARVEST TECHNOLOGY**

1. Piston displacement is the volume displaced by the piston during one stroke and is usually expressed in
  1. cubic meter
  2. cubic inches
  3. both of these
  4. none of these

2. if piston displacement is deducted from the total volume of cylinder the remaining volume is known as
  - 1.piston displacement 2. clearance volume 3. displacement volume 4.compression ratio
  
3. which of the following types of internal combustion engine is generally used as portable engine for pumping and electricity generation?
  1. spark ignition 2. Stationary 3. vertical single cylinder 3. all of these
  
4. heavy smoking in an engine in operation may be due to
  1. overloading 2. mixtures 3. late injection 4. all of these
  
5. in tractor transmission oil and oil from the steering worm and sector housing should be changed after how many working hrs?
  - 1.450 2. 550 3. 650 4. 750
  
6. one hp is equal to
  1. 246watts 2. 250 watts 3. 746watts 4. 1000watts
  
7. in four stroke engine there is one power stroke for every \_\_\_ revolutions' of the cranks shaft
  - a. 1 b. 2 c. 3 d.4
  
8. which of the following is a device used on a tractor or stationary engine for maintaining nearly constant engine speed under varying loads?
  1. volatility of fuel 2. governor 3. pre-ignition 4. carburator
  
9. the violent noises heard in an engine during the process of combustion after the position has passed over the top dead center is known as?
  1. stationary 2. spark ignition 3. detonation 4. all of these

10. tractor engine oil should be changed and all grease points should be lubricated after every \_\_\_\_ working hrs  
1. 15 2. 30 3. 60 4. 120
11. in tractor engine the complete path of power from the engine to the wheel is called  
1. power train 2. power wheel 3. both 1 and 2 4. none of these
12. the hp available at the crank shaft which is measured by a suitable dynamo meter is called  
1. IMEP 2. BHP 3. both 1 and 2 4. none of these
13. in tractor engine which of the following is a device in which liquid fuel is converted into gaseous fuel?  
1. piston 2. carburetor 3. both 1 and 2 4. none of these
14. optimum engine temp is about how many degree  
1. 60 2. 82 3. 100 4. 120
15. maximum torque in a tractor is generated at  
1. rated rpm 2. less than rated rpm 3. rated hp 4. maximum idling
16. the injection pressure of ic engine used on tractors is in range of \_\_\_\_ kg/cm<sup>2</sup>  
1. 0-6 2. 60-120 3. 120-200 4. 200-300
17. a turbo chargers are driven by  
1. engine 2. exhaust gas 3. dynamo 4. PTO
18. the device for engaging and disengaging the power shaft from the gearbox is known as  
1. shaft 2. gear 3. clutch 4. circuit