Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

AUTOMOBILE ENGINEERING

U14AUTE14: Automotive Components Manufacturing

COURSE OUTCOMES

CO1: Understand the Automotive Engine and Transmission system components Manufacturing Process

CO2: Understand the Heat Treatment and surface treatment process used for Engine and Transmission system Components Manufacturing

CO3: Understand the Automotive vehicle Body and Electrical system Components Manufacturing Process

CO4: Understand the surface coating process used in Automotive Industry

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the following terms connection with casting processes CO1 [K_1]

List I	List II
A.Slick	i. Directional solidification
B.Metal patterns	ii.Symmetrical shape
C.Centrifugal casting	iii.Repairing and finishing the mould
D.Chills and padding	iv.Large scale production of castings

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	ii	i
c)	ii	iv	iii	i
d)	iii	i	ii	iv

2. A piston has the following no of piston rings CO2 [K_1]

a) 2 b) 3

c) 4 d) 5

3. Consider the following statements CO2 [K_1]

1.In gear shaping separate indexing is not required

2.The gear hobbing machines can produce unsymmetrical shapes

3. In gear hobbing, the gear blank is first moved in toward the rotating hob until the proper depth is reached.

4. The gear hobbers cannot produce helical gears.

Which of these statements are correct?

a) 1,3 b) 1,4

c) 1,2 d) 2,3

4. The mass production parts of screws,rivets,head bolts are made by following process CO2 [K1]

a) Orbital Forming b) Extrusion

c) Rolling d) Upset Forging

5. Assertion (A):Sol-Gel Technique can produce high purity thin bond-coating of products CO4 [K2]

Reason (R): The organo-metallic precursor of the desired ceramic oxides can be mixed, dissolved in a specified solvent and hydrolyzed into a sol, and subsequently a gel, the composition can be highly controllable.

a) Both A and R are Individually true and R is the correct explanation of A

b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

6. Ball bearings are usually made from CO1 [K_1]

a) Low carbon steel b) High carbon steel

c) Medium carbon steel d) Chrome steel

7. Following design considerations for parts manufactured using injection molding CO3 [K3]

1. Preparation of the mold cavity

2.Solidification

3.Proper flow of plastic to all the parts in the mold

4.Shrinkage of the plastic

a) 2-3-4-1 b) 1-3-2-4

c) 3-4-2-1 d) 4-1-3-2

8. Welding nuggets are obtained in the case of CO2 [K1]

a) Thermit welding b) Spot welding

c) Submerged are welding d) Leaser welding

9. Assertion (A): In thermit welding, a mixture of iron oxide and aluminium known as thermit is used CO3 [K_2]

Reason (R): It results in minimum problem with internal residual stresses

a) Both A and R are Individually true and R is the correct explanation of A

b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

10. The function of regulator in automobiles is CO4 [K_3]

a) Reducing the speed

b) Prevents the generation of excessive voltage

c) Used to ignite the fuel

d) Restores the current in battery

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11.	List the main advantages of squeeze casting	CO1	[K1]
12.	What is upset forging?	CO1	[K_2]
13.	Categorize the various types of phenolic molding compounds	CO2	[K_4]
14.	Mention the advantages and applications of fine blanking operation	CO2	[K_1]
15.	Phosphate coating is a common practice for cold extrusion of propeller shafts-Validate the statement	CO2	[K_5]
16.	Explain the surface hardening procedure of propeller shaft.	CO2	[K_2]
17.	Discuss the features of RRIM	CO3	[K_6]
18.	Classify the body damages in auto body	CO3	[K_4]
19.	Identify the fundamental CVD processes using line diagram	CO4	[K_3]
20.	What is the purpose of brake warning light?	CO4	[K_1]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Describe the recent methods and materials used for manufacturing the automotive engine blocks CO1 [K_2]

22.	i) Briefly describe the molding of cylinder head materials by the Lost-Wax casting process using gypsum mold	(7)	CO1	[K_2]
	ii) How to manufacture a bevel gears in gear generation process?	(7)	CO2	[K_1]
23.	i) What is meant by orbital forging? Why its need for mass production of gears?	(7)	CO2	[K_1]
	ii) Compare between orbital forging and conventional forging.	(7)	CO2	[K_4]
24.	Discuss in detail the six basic processes involved in manufacturing of tyres.		CO2	[K_6]
25.	Identify the various new welding techniques adopted in automotive industries for build the auto body parts and explain with neat sketch.		CO3	[K_3]
26.	i) Discuss the principle of operation of a lead acid battery	(7)	CO4	[K_6]
	ii) Name the two main hydroforming methods and elaborates its principles.	(7)	CO3	[K_1]
27.	Explain in detail about the physical vapour deposition process with neat diagrams		CO4	[K_5]

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