(10 Marks) (06 Marks)

## USN

## First/Second Semester R.F. Degree Evamination December 2012

	1	11 50	Elements of Mechan		2012	
Tir	ne: 3	hrs.		Max.	Marks:100	
No	2.	. Ans	wer any FIVE full questions, choosing wer all objective type questions only on wer to objective type questions on shee	OMR sheet page 5 of the ansi		
			PART –	A		
1	a.	Choose the correct answers for the following:				
		i)	Ocean tides containing a large amount o A) Kinetic Energy C) Potential and Kinetic Energy	B) Potential Energy		
		ii)	Nuclear energy is obtained by re A) Fission C) Fission and Fusion	eaction in nuclear reactor B) Fusion D) None of these		
		iii)	The function of the fusible plug in the boat A) increase flue gas temp C) Extinguish the fire in furnace	B) Increase life of boiler D) drain off the condensed s	steam	
		iv)	An example for fire tube boiler is A) Cochran Boiler C) Both A and B	B) Lancashire Boiler D) None of these.	(04 Marks)	
	b.	Def	ine renewable and non renewable energy s	sources and give examples.	(06 Marks)	
	c.	With	n a neat sketch, explain the working of Bal	ocock and Wilcox boiler.	(10 Marks)	
2 a. Choose the correct answers fo			ose the correct answers for the following	:		
		i)	Method of reducing of working A) Velocity C) Speed and pressure	fluid is know as compounding  B) Pressure and Temperatur  D) None	e	
		ii)	In a reaction turbine drops when A) Velocity C) Temperature	the fluid passes over blades B) Pressure D) None		
		iii)	Pelton wheel flow turbine A) Radial C) Tangential	B) Axial D) None		
		iv)	In a open cycle gas turbine transfer between system and surround A) Mass Transfer C) Heat Transfer		neat and work (04 Marks)	

3	a.	Choose the correct answers for the following:			
		i)	In petrol engine heat is suppl	ied at constant	
			<ul><li>A) Temperature</li><li>C) Pressure</li></ul>	B) Volume D) Enthalpy	
		ii)	Carburettor is used in	engine	
			<ul><li>A) Diesel</li><li>C) Crude oil</li></ul>	<ul><li>B) Petrol</li><li>D) None of these</li></ul>	
		iii)	ston and Crank shaft by means of pin joints is o	alled as	
			<ul><li>A) Cylinder</li><li>C) Connecting Rod</li></ul>	B) Cam Shaft D) None	
		iv) Number of strokes required to complete 1 cycle in 4 stroke engine is			<del></del>
			A) 8 C) 1	B) 2 D) 4.	(04 Marks)
	b.	With the help of a p-v diagram, explain the working of 4 stroke diesel engine. (10 Marks			(10 Marks)
4	a.	mep = 6 bar. Fuel consumption = 0.0013 kg/sec. Sp gr of fuel = 0.78, CV. of fuel = 4390 kJ/kg. Find i) BP ii) IP iii) FP. (06 Ma)  Choose the correct answers for the following:			
		i) The boiling point temperature of Freon – 12 is			
			A) -20.8° C C) -40.8° C	B) -29.8° C D) -33.3° C	
		ii)	A good refrigerant should have	ve	
			<ul><li>A) Low Specific Heat</li><li>C) Low Freezing Point</li></ul>	B) Low Viscosity D) All	
		iii)	n vapour absorption refrigeration system is		
			A) Freon – 22 C) Ammonia	B) Freon - 12 D) CO <sub>2</sub>	
		iv)	rator is measured by a factor known as		
			<ul><li>A) Ton of refrigeration</li><li>C) Litres</li></ul>	B) COP D) None.	(04 Marks)
	b.	What are the desirable properties of refrigerant? List four commonly used refrigerants.  (06 Marks)			
	c.				(10 Marks)

## PART – B

5	a.	Choose the correct answers for the following:				
		i)	An operation of enlarging an existing hole is			
			<ul><li>A) Counter Boring</li><li>C) Boring</li></ul>	<ul><li>B) Counter Sinking</li><li>D) Tapping</li></ul>		
		ii)	Taper angle of rod at which compound rest to be swiveled is			
			A) $\tan \alpha = \frac{D-d}{L}$	B) $\tan \alpha = \frac{D-d}{2L}$		
			C) $\tan \alpha = \frac{2(D-d)}{L}$	D) None		
		iii)	The operation of cutting internal threads in	a drilled hole is called		
			<ul><li>A) Boring</li><li>C) Reaming</li></ul>	<ul><li>B) Counter sinking</li><li>D) Tapping</li></ul>		
		iv)	Shank is the portion of			
			<ul><li>A) Lathe tool</li><li>C) Drill bit</li></ul>	B) Thread Cutting Tool D) None of these.	(04 Marks)	
	b. с.	i) Facing ii) Cylindrical Turning.  Draw a neat sketch of radial drilling machine and explain its working.				
6	a.	Choose the correct answers for the following:				
		i)	Up and down moving part of milling mach			
			<ul><li>A) Saddle</li><li>C) Spindle</li></ul>	B) Arbor D) Knee		
		ii)	The process used to machine contours cons	ists of curves is		
			<ul><li>A) Angular Milling</li><li>C) Form Milling</li></ul>	B) Sow Milling D) End Milling		
		iii)	ing as polishing operation			
			<ul><li>A) Abrassive</li><li>C) Adhesives</li></ul>	<ul><li>B) Bonds</li><li>D) None</li></ul>		
		iv)	In process the work piece is fed in A) Horizontal Milling C) Down Milling	opposite direction as that of cutto B) Vertical Milling D) Up Milling.	er direction (04 Marks)	
	b. с.				(10 Marks) (06 Marks)	

7	a.	Choose the correct answers for the following:					
•			In pressure welding the parts to be joined as	re heated to state			
			A) Liquid State	B) Boiling State			
			C) Plastic State	D) none of these			
		ii)	The joining process which uses special fusible alloy to join 2 similar or dissimilar parts is				
			<ul><li>A) Soldering</li><li>C) Welding</li></ul>	B) Brazing D) All			
		iii)	An example for solid lubricants is				
			<ul><li>A) Synthetic Oil</li><li>C) Tale</li></ul>	B) Grease D) None			
		iv)	is a property of a good lubricant				
			<ul><li>A) Porosity</li><li>C) Viscosity</li></ul>	B) Electricity D) None.	(04 Marks)		
	b.	Sketo	ch and explain electric are welding process.	,	(08 Marks)		
	c.		t is the necessity of lubrication? List the type	s of lubricants used.	(04 Marks)		
	d.	With	a neat sketch explain the ball bearing.		(04 Marks)		
8	a.	a. Choose the correct answers for the following:					
		i)	The gear used for intersecting axes shafts is	gear			
			<ul><li>A) Spur</li><li>C) Spiral</li></ul>	B) Helical D) Bevel			
ii) The ratio of pitch diameter to the number of teeth is called				f teeth is called			
			A) Module	B) Dedendum			
			C) Adendum	D) None			
		iii)	Due to slip of the belt, the velocity ratio of the belt drive				
			<ul><li>A) Decreases</li><li>C) Remains Same</li></ul>	<ul><li>B) Increases</li><li>D) None of these</li></ul>			
		iv)	The length of open belt pulley of diameter	rs d <sub>1</sub> and d <sub>2</sub> kept at a distance	'x' apart is		
			A) $\frac{\pi}{2}(d_1 + d_2) + 2x + \frac{(d_1 + d_2)^2}{4r}$	B) $\frac{\pi}{2}(d_1-d_2)+2x+\frac{(d_1-d_2)}{4r}$	2)2		
			C) $\frac{\pi}{2}(d_1+d_2)+2x+\frac{(d_1-d_2)^2}{4r}$	D) $\frac{\pi}{2}(d_1-d_2)+2x+\frac{(d_1+d_2)}{4r}$	$(2)^{2}$ .		
					(04 Marks)		
	b.	A compound gear train consists of 4 gears P, Q, R and S having 20, 40, 60 and 80 teeth respectively. The gear P is keyed to driving shaft, Gear S to driven shaft. Q and R are compound gears, Q meeting with P and R meshes S. If P rotates at 150 rpm, what is the rpm					
			of gear S. (08 Marks)				
c. Distinguish between: i) Open and cross belt drive					,		
			ii) Simple and compound g	gear train.	(08 Marks)		