Program: BE Mechanical Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: MEC604 and Course Name: Thermal and Fluid Power Engineering

Time: 1hour Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

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| Q1.  | Maximum Number of jets, generally, employed in an impulse turbine without jet interference can be? |
| Option A: | 2 |
| Option B: | 3 |
| Option C: | 4 |
| Option D:  | 6 |
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| Q2. | With increase in pressure ratio, thermal efficiency of simple gas turbine plant with fixed turbine inlet temperature |
| Option A: | Increases |
| Option B: | Decreases |
| Option C: | First increases then decreases |
| Option D: | First decreases then increases |
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| Q3. | With ideal regenerative heat exchanger ,the thermal efficiency of gas turbine cycle is |
| Option A: | Equal to work ratio |
| Option B: | Is less than work ratio |
| Option C: | Is more than work ratio |
| Option D: | Un predictable |
|  |  |
| Q4. | With intercooling and reheating in a two stage gas turbine plant |
| Option A: | Both work ratio and thermal efficiency improve |
| Option B: | Work ratio improves but thermal efficiency decreases |
| Option C: | Thermal efficiency improves but work ratio decreases |
| Option D: | Both work ratio and thermal efficiency decreases |
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| Q5. | For jet propulsion unit, ideally the compressor work and turbine work are |
| Option A: | Unequal |
| Option B: | Equal |
| Option C: | Not related to each other |
| Option D:  | Unpredictable |
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| Q6. | Greater the difference between jet velocity and aero plane velocity |
| Option A: | Greater the propulsive efficiency |
| Option B: | Less the propulsive efficiency |
| Option C: | Unaffected is the propulsive efficiency |
| Option D:  | Unpredictable |
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| Q7.  | Reheat factor in steam turbines depends on  |
| Option A: | Stage efficiency only |
| Option B: | Initial pressure and temperature |
| Option C: | Exit pressure |
| Option D:  | Inlet pressure |
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| Q8.  | The value of reheat factor normally varies from |
| Option A: | 1.2 to 1.6 |
| Option B: | 1.02 to 1.06 |
| Option C: | 0.9 to 0.95 |
| Option D:  | 0.5 to 0.6 |
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| Q9. | The governing of steam turbine is done by the following method |
| Option A: | Throttle governing |
| Option B: | Nozzle control governing |
| Option C: | By-pass governing |
| Option D:  | Hartnel governing  |
|  |  |
| Q10.  | Which of the below mentioned is a fire tube boiler |
| Option A: | Stirling |
| Option B: | Babcock Wilcock boiler |
| Option C: | Velox boiler |
| Option D:  | Locomotive boiler |
|  |  |
| Q11.  | Calculate work done by jet per second on the runner where, discharge=0.7cubic meters/s, inlet and outlet whirl velocities be 23.77 and 2.94? |
| Option A: | 200Kw |
| Option B: | 150Kw |
| Option C: | 187Kw |
| Option D:  | 250Kw |
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| Q12.  | In case of gas turbines and compressors, degree of reaction is \_\_\_\_\_\_\_\_ |
| Option A: | Static pressure drop in rotor/ static pressure drop in stage |
| Option B: | Static pressure drop in stage/ static pressure drop in rotor |
| Option C: | Isentropic enthalpy drop in rotor/ isentropic enthalpy drop in stage |
| Option D: | Static temperature drop in stage/ static temperature drop in |
|  |  |
| Q13. | The velocity of flow through a Kaplan turbine is 10 m/s. The outer diameter of the runner is 4 m and the hub diameter is 2 m. Find the volume flow rate of the turbine in m3/s? |
| Option A: | 95 |
| Option B: | 75 |
| Option C: | 85 |
| Option D:  | 105 |
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| Q14.  | A gas turbine expands 4 kg/s of air from 12 bar and 900oC to 1 bar adiabatically with an isentropic efficiency of 87%. Calculate the exhaust temperature and the power output. γ = 1.4 cp = 1005 J/kg K  |
| Option A: | 1.135 MW |
| Option B: | 2.135 MW |
| Option C: | 3.135 MW |
| Option D:  | 4.135 MW |
|  |  |
| Q15. | Benson steam generator pressure range is |
| Option A: | 100bar to 150 bar |
| Option B: | 150 bar to 200 bar |
| Option C: | 230bar to 250 bar |
| Option D:  | 50 bar to 100 bar |
|  |  |
| Q16.  | The tube diameter in case of controlled circulation steam generators as compared to natural circulation steam generators are |
| Option A: | Larger |
| Option B: | Smaller |
| Option C: | Same |
| Option D:  | May be larger or smaller independent of circulation method. |
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| Q17. |  In an ideal Turbojet engine after heat addition to compressed air, the working substance is expanded in  |
| Option A: | exit nozzle at constant pressure |
| Option B: | exit nozzle at isentropic manner |
| Option C: | turbine blade at constant temperature |
| Option D: | turbine blade in isentropic manner |
|  |  |
| Q18. | The overall efficiency of a reaction turbine is the ratio of |
| Option A: | Actual work available at the turbine to the energy imparted to the wheel |
| Option B: | Work done on the wheel to the energy (or head of water) actually supplied to the turbine |
| Option C: | Power produced by the turbine to the energy actually supplied by the turbine |
| Option D:  | Actual work available at the turbine to energy imparted to the wheel |
|  |  |
| Q19.  | Component of boiler installation to recover the heat of exhaust gases before furnace is called |
| Option A: | Super heater |
| Option B: | Economizer |
| Option C: | Chimney |
| Option D:  | Air pre heater |
|  |  |
| Q20. | Pelton wheel, if outlet velocity angle of jet is “right angled” then outlet whirl velocity of jet is \_\_\_\_\_\_\_\_\_\_ |
| Option A: | x- component of V (r2) – blade velocity |
| Option B: | x- component of V (r2) + blade velocity |
| Option C: | Blade velocity – x- component of V (r2) |
| Option D: | Zero |
|  |  |
| Q21. | Function of blow down cock in boiler is |
| Option A: | To maintain water level by draining excess water  |
| Option B: | To empty the water drum of the boiler |
| Option C: | To remove sludge and sediments collected in drum |
| Option D:  | To blow off steam to maintain safe pressure |
|  |  |
| Q22.  | The work done per unit weight of water jet striking runner blades of Pelton turbine is given by expression \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | [Vw1+Vw2] u/g |
| Option B: | Vw1\*u/g |
| Option C: | [Vw1+Vw2]/g |
| Option D:  | [Vw1+Vw2]u |
|  |  |
| Q23. | In an [impulse turbine](https://www.mechanicaltutorial.com/working-principle-of-impulse-and-reaction-steam-turbine)....... |
| Option A: | The steam is expanded in [nozzles](https://www.mechanicaltutorial.com/steam-nozzle-objective-questions-and-answers) only and there is a pressure drop and heat drop |
| Option B: | The steam is expanded both in fixed and moving blades continuously |
| Option C: | The steam is expanded in moving blades only |
| Option D:  | The pressure and temperature of steam remains constant |
|  |  |
| Q24.  | The best suited steam generator for fluctuating demand is  |
| Option A: | Babcock and Wilcox |
| Option B: | Lancashire |
| Option C: | Locomotive |
| Option D:  | Corinish |
|  |  |
| Q25. | The thermal efficiency of good steam generator of thermal power generator may be range of |
| Option A: | 80 to 90% |
| Option B: | 30 to 40% |
| Option C: | 10 to 20% |
| Option D:  | 50 to 60% |