SEAL

60712			
ROLL No.			

TEST BOOKLET No.

066

TEST FOR POST GRADUATE PROGRAMMES

ENGINEERING SCIENCE

Time: 2 Hours Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

- 1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.
- 2. Write your Roll Number in the space provided on the top of this page.
- 3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the Answer Sheet. Darken the appropriate bubbles with a Ball Point Pen.
- 4. The paper consists of 150 objective type questions. All questions carry equal marks.
- 5. Each question has four alternative responses marked A, B, C and D and you have to darken the bubble fully by a Ball Point Pen corresponding to the correct response as indicated in the example shown on the Answer Sheet.
- 6. Each correct answer carries 3 marks and each wrong answer carries 1 minus mark.
- 7. Please do your rough work only on the space provided for it at the end of this Test Booklet.
- 8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.
- 9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of such unforeseen happenings the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

ENGINEERING SCIENCE

1.	Increase	e in Dissolved Oxygen in a water body is observed during				
	` '	Chemo Oxidation Photosynthesis		Reduction Photocatalysis		
2.	Mainter municip	nance of good public health a palities in India according to	nd sa of t	anitation is the prime duty of the Constitution of India.		
	(A) (C)	69 th Amendment 73 rd and 74 th Amendments	(B) (D)	70 th Amendment None of the above		
3.	Adsorptio	on process is a				
		physical phenomenon biological phenomenon	(B) (D)	physico-chemical phenomenon chemical phenomenon		
4.	Hydrogen	sulphide in sewers causes				
		Methane production Staling of sewage	(B) (D)	Bursting Crown corrosion		
5.	For BOD	s at 20°C, reaction rate constant (K) for	r domestic wastewater is around		
		0.25/day 0.10/day	(B) (D)			
6.	Generally	the percentage of MLVSS in M	LSS is	S		
		100% 75%		80% 50%		
7.	Typical	density of food wastes in solid v	vastes	is		
	(A) (C)	300 kg / m^3 195 kg / m ³	(B) (D)	130 kg / m ³ 290 kg / m ³		
8.	The ma	ximum noise level that human ca	ın hea	r is		
	(A) (C)	120 dB 80 dB	(B) (D)	140 dB 190 dB		



9.	The pro	ocess of removing contaminants i	from s	oil and groundwater is termed as
	(A)	Bioengineering	(B)	Bioprocess
	(C)			Biomagnification
10.	Attache	ed growth system of waste treatm	ent is	preferred due to
	(A)	maximum surface area		maximum depth
	(C)	maximum length	(D)	maximum efficiency
11.	In anae	robic digestion percentage of cor	iversio	on of acetic acid to methane is
	(A)	50%	(B)	60%
	(C)	72%	(D)	75%
12.	Destabi	lization and removal of colloids	mainly	y depend on
	(A)	Size	(B)	General Properties
	(C)	Electro-kinetic Properties	(D)	Settling velocity
13.	Workin	g of Flame Photometer is based	on	
	(A)	Optical Method	(B)	Emission Method
	(C)	Resonance Method	(D)	Electrical Method
14.	Instrear	n standards refer to		
	(A) (C)	Effluent Discharge Standards Receiving Stream Standards		Raw Wastewater Characteristics None of the above
15.	Mass cu	arve method is adopted to determ	ine	
		Volume of Equalization tank Volume of Digester		Volume of Sedimentation Tank Volume of Filter
16.		of the following refers to a cal waste treatment?	erobic	suspended growth system of
		Trickling Filter Activated Sludge Process (ASP		B) UASB D) Secondary Clarifier
17.	The uni	t of measurement for Ozone laye	er thicl	mess is
	(A)		(B)	Arithmetical units
	(C)	Geometrical units	(D)	Decibel unit



18.	Settling	velocity of a particle in a sedim	entatio	on tank is determined using
		Chezy's equation Manning's equation		Hazen-William's equation Newton's equation
19.	Typical	BOD ₅ Value of Strong sewage	is	
		400 mg/L 350 mg/L	(B) (D)	720 mg / L 200 mg / L
20.	DDT is	a		
		Bio pesticide Organic pesticide	(B) (D)	
21.	The gui	deline DO concentration in river	s is	
	` '	2.0 mg/L 3.2 mg/L		4.0 mg/L 8.0 mg/L
22.	The relationship between Chlorine concentration (C) and contact time (t) expressed by			
		C = t k $k = C t$	(B) (D)	$t = C k$ $C^n t_p = k$
23.	Carbox	yhaemoglobin is a product of		
		CO ₂ & CO CO ₂ & Hb		CO & Hb CO & HC
24.	The ren	noval of colloids in water is done	by	
	(A) (C)	Coagulation & Flocculation Filtration	, ,	Plain Sedimentation Aeration
25.	MPN st	ands for		
	(A) (C)	Most Probable Number Most Polluted Norm	(B) (D)	Mixpipox Network None of the above



26.	MPN i	n treated drinking water must be	,	•
	(A) (C)		(B) (D)	
27.	Sodium	n Absorption Ratio (SAR) is an	indicat	or of
	, ,	Soil Pollution Air Pollution	(B) (D)	Water Pollution None of the above
28	Sewer	network system is designed for		
	(B) (C)	water conveyance oil conveyance petrol conveyance domestic wastewater conveyar	nce	
29.	Allowa	ble pH range for potable water i	S	Ě
		7 to 8 6.5 to 8.0		8 to 9 4.5 to 6.5
30.	2-D mo	odels refer to the prediction of po	ollutant	concentration in
		Y and Z directions X and Y directions		X, Y and Z directions X and Z directions
31.	Aeratio	n process is used to remove		
	(A) (C)	Dissolved gases Bacteria	(B) (D)	Denser particles None of the above
32.	Bhopal	gas tragedy was caused by		
	. ,	Mercury leakage Chlorine leakage	(B) (D)	MIC leakage LPG leakage
33.	SO ₂ is r	nainly responsible for		
	(A) (C)	Green-house effect Acid Rain	(B) (D)	Heat-island effect None of the above



34.	The best practice of reducing pollution is				
	(A) (C)	Waste minimization Reuse	(B) (D)	Recycle None of the above	
35.	The ma	ajor gases expected from a sanitar	y land	ifill are	
		CO ₂ and CH ₄ CO and CO ₂	(B) (D)		
36.	Which of the following is the most efficient in removing SPM?				
	(A) (C)	Cyclone separator Electrostatic Precipitator	(B) (D)	Scrubber Fabric Filter	
37.	Gravita	tional settling chambers are used	in co	ntrolling	
	(A) (C)	and the second s	(B) (D)	Oxides of sulphur Carbon Monoxide	
38.	Maxim	um mixing depth (MMD) means			
	(A) (B) (C) (D)	height at which complete disper no dispersion of pollutant	sion (of pollutant occurs	
39.	Windro	se is a diagram which indicates			
	(A) (C)	Wind Speed Both wind speed and direction	` '	Wind Direction None of the above	
40.	London	smog was due to			
	(A) (C)	burning of petrol burning of coal	(B) (D)	burning of diesel burning of solid wastes	
41.	Streete	r-Phelps equation is used to deter	mine	"" in rivers.	
	(A) (C)		(B) (D)		



42.	Jar test apparatus is used for determining				
	(A) (C)	-	(B) (D)	BOD Turbidity of water	
43.	For bio	logical waste treatment BOD5/C0	OD ra	tio must be greater than	
	(A) (C)	1 0.9	(B) (D)	0.4 None of the above	
44.	Unit Op	perations represent			
	(A) (B) (C) (D)	Chemical Treatment Processes Biological Treatment Processes Physical Treatment Units None of the above			
45.	Softenin	ng is a commonly practised proce	ess to	remove	
	(A) (C)	Hardness from water Toxic chemicals from water	(B) (D)		
46.	Type 2	settling refers to			
	(A) (C)	Discrete particles settling Hindered settling	(B) (D)	<u>-</u>	
47.	θ _C repre	esents			
	(A) (B) (C) (D)	Hydraulic retention time (HRT) Biological sludge retention time Settling time None of the above	(BSR	CT)	
48.	UASB s	tands for			
	(C)	upflow aerobic sludge blanket upflow anaerobic sludge blanket upflow facultative sludge blanket None of the above			



49.	Smokin	ig of tobacco generally reduces		
	(C)	Platelet count of blood Oxygen carrying capacity of blo RBCs of the blood WBCs of the blood	bod	
50.	Refract	ory organics are		
		easily biodegradable inorganic elements	(B) (D)	non-biodegradable None of the above
51.	Rapid E	IIA is carried out in a time span o	of	
	(A) (C)	10 months 3 months	(B) (D)	12 months 6 months
52.	Noise is	measured by		
	` '	sound level meter pressure meter	(B) (D)	aqua meter bolometer
53.	Isomeri	c property is exhibited by		
	(B)	compounds with carbon atom at	ictura tachn	l formula nent
54.		lationship between the concentration is explained by	tration	n of adsorbate and its sorbed
	(A) (C)	Isotherm Chemical reaction	(B) (D)	Non-isotherm Oxidation
55.	Randon	n motion of colloids is called		
	(A) (C)	Van der Waals Force Attachment	(B) (D)	Brownian Movement Detachment



56.	 Mottling of teeth is common when fluoride concentrations in drinking we exceed 				
		1.5 mg/L 2.5 mg/L		2.0 mg/L 0.5 mg/L	
57.	Accum	ulation of heavy metals in the aq	uatic	flora & fauna is termed	
	, ,	Bioconcentration Biomagnification		Biofiltration Bioremedication	
58.		r contains 40 mg/L of Ca ⁺⁺ and ed in mg/L as CaCO ₃ ?	10 mg	/L of Mg ⁺⁺ , what is the hardness	
		141 mg/L 300 mg/L		150 mg/L 400 mg/L	
59. Hardness range as CaCO ₃ in moderately hard water is					
	, ,	150-300 mg/L 50-150 mg/L	` '	50-100 mg/L None of the above	
60.	Horizon	ntal velocity in a grit chamber is	maint	ained at	
		1 m/sec 0.1 m/sec		2 m/sec 0.3 m/sec	
61.	End pro	ducts of aerobic reaction are			
		CH ₄ and H ₄ CO ₂ and H ₂ O		NH ₃ and NO ₃ NO ₃ and H ₂ S	
62.	Ground	water recharge with treated efflu	ient is	called	
		Artificial recharge Rain Water Harvesting		Natural recharge None of the above	
63.	The fric	tion loss in filter beds is determi	ned by	y	
	(A) (C)	Hazen-Willam's Equation Carmen-Kozney Equation	(B) (D)	Differential Equation Statistical Equation	



64. Vigorous stirring induces				
	(A) (C)		(B) (D)	
65.	Acceler	ated growth of bacterial cells is	erme	l as
		Lag Phase Exponential Phase	(B) (D)	
66.	The ma	jor photochemical oxidant is		
	(A) (C)	Ozone Hydrogen	(B) (D)	Oxygen Nitrogen
67.	Reactiv	ity is one of the characteristics o	f	
	(A) (C)	Oil Hazardous Wastes	(B) (D)	Wastewater None of the above
68.	Vadose	zone is referred to		
	(B)	zone from middle of water dept	to the	
69.	F/Mb	y ratio is given by		
		$F/M = Q(S_0 - S) / VX$ $F/M = Q(S_0 - S) / V$		$F/M = (S_0 - S) / VX$ $F/M = Q(S_0 - S) / X$
70.	Endoge	nous growth phase refers to		
	(A) (C)	decay of bacteria exponential growth		stationary growth lag growth
71.	Conduc	tivity represents the concentratio	n of tl	ne following in the water sample
	` '	total solids volatile solids	(B) (D)	dissolved solids fixed solids



72.	A water	sample is termed turbid when	it	•
	(A) (B) (C) (D)	fails to transmit light through is rich in suspended solids is rich in both suspended and is rich in total solids		l solid
73.	BOD re	presents		
	(A) (B) (C) (D)	Pollutional strength of waste pollutional strength of an orga pollutional strength of inorga pollutional strength of biodeg	nic fract	ion of wastes
74.	The val	ue of COD is generally higher	than tha	t of BOD because
	(A) (B) (C) (D)	the strong oxidizing condition complete oxidation of organic oxidation of gases like ammo the stablest compound are be	e and inc nia	organic compounds
75.	In a D.0	O. test oxygen is replaced by ec	quivalen	t in
		iodine manganous sulphate	(B) (D)	sodium thiosulphate sulphuric acid
76.	A trap i	is intended to prevent the passa	ige of	
	(A) (C)	water any liquid waste	(B) (D)	sewage of sullage foul gases
77.	Becaus	e of sludge bulking		
	(A) (B) (C) (D)	sludge settles quickly in clari		
78.	The pip	oe having minimum dia in plun	nbing sy	stem is
		waste pipe ventilating pipe	(B) (D)	soil pipe anti syphonage pipe



79.	Waste	pipe collects liquid waste	es from		
		toilets and urinals	(B)	wash basin and baths	
	(C)	urinals and kitchen	(D)	from any room	
80.	The fur	nction of cowl is to			
	(A)	give ornamental look			
	(B)			ste pipe	
	(C)		es		
	(D)	prevent nest building			
81.	A food	chain			
	(A)	is transfer of energy fro	m one organ	ism to another	
	(B)	is relationship between	producers, he	erbivores and carnivores	
	(C)	is comprising of any the	ree or more o	rganisms	
	(D)	is combination of organ	isms at diffe	rent tropic levels	
82.	Eutroph	nication is			
	(A)	due to flow of nitrates a	nd phosphate	es into stagnant bodies of water	er
	(B)	growth of blue green als	gae	•	
	(C)	super saturation of wat	er with disso	olved oxygen due to green a	.lgae
	(D)	decomposition of organ	ic bottom mu	ıd	
83.		is produced out of coal, because of	, wood, toba	cco or other products contain	ning
	(A)			eve stoichiometric combustio	n
	(B)	-			
	(C)	temperature of combust		-	
	(D)	any one or combinations	s of the above	2	
84.	Cloudy	skies promote an atmosp	heric condition	on of	
	(A)		(B)	unstability	
	(C)	neutrality	(D)	inversion	



85.	The unit that cleans dust because of the mechanical straining, sedimentation, inertial force, electrostatic attraction and diffusion is			
	(A) (C)		(B) (D)	
86.	Fly ash	comes from		
	(A) (C)	cement plant refinery	(B) (D)	power plant paper industry
87.	Which	industrial waste is likely to have	a very	high BOD
		pharmaceuticals distilleries	(B) (D)	tanneries textiles
88.	Accepta	able noise level in silent zone is		
	(A) (C)	45 dB 60 dB	(B) (D)	50 dB 100 d B
89.	Which	of the following is a waterborne	liseas	e?
		Malaria Flu	(B) (D)	Cholera Botulism
90.	Select t	he wrong statement		
			from t	the Government
91.	The dut	y of a Pollution Control Board is		
	(A) (B) (C) (D)	 (B) to continuously monitor the environment surrounding the industry (C) to prepare a code of practice for preventing pollution from an industry 		



92.	2. High volume sampler is used to			
	(A) (B) (C) (D)	measure moisture content in ai measure particulate matter in a		phere
93.	Duct ar	nd Hood is used in industry to		
	(A) (C)	prevent indoor air pollution to collect dust	(B) (D)	prevent air pollution to dispose flue gas
94.	Remov	al of dissolved solids in water is	possit	ole by
	` '	aeration ion exchange	(B) (D)	lime treatment coagulation
95.	Fluoride	es are removed by		
	(A) (C)		(B) (D)	-
96.	Taste ar	nd odour of water is removed by		
		biological decomposition adsorption	(B) (D)	oxidation distillation
97.	A good	source of water requiring practic	ally th	ne least treatment is
	(A) (C)	a perennial river a deep well	(B) (D)	an impounded reservoir an elevated lake
98.	Water fi	rom the following source is likel	y to be	e hard
		river deep well	(B) (D)	lake shallow well
99.	Metham	oglobanemia is caused by		
	(A) (C)	Fluorides Sulphates	(B) (D)	Chlorides Nitrates



100.	exceeds			on when furbidity of raw water
	, ,	5 units 50 units	(B) (D)	
101.	Over fl	ow rate of a sedimentation tank	is	
	- ,	Q/ plan area Q/cross sectional area	(B) (D)	Q/ area of longitudinal section Q/plan area x liquid area
102.	This is	used to treat swimming pool wa	ter	
	(A) (C)		(B) (D)	rapid sand filter both rapid and slow sand filters
103.	Mud ba	alls are formed in a filter because	of	
	(A) (B) (C) (D)	quick filtration of turbid water frequent back washing		nd sand grains due to inefficient
104.	Super c	hlorination is done		
	(B) (C)	in day to day practice during summer during epidemics when no other treatment is give	en to w	vater
105.	Ultra vi	olet rays are highly effective for	disinf	ection of
	(A) (C)	clear waters highly turbid waters	(B) (D)	hard waters waters rich in suspended solids
106.	The pur	pose of stand pipe is that it		,
	(C)	increases storage capacity of wa helps fire fighting is of great help in intermittent s boosts pressures in pipes		system



107.	1	oppe that is light, having low of sion is	o-effi	cient of expansion and resistant to
	(A) cement concrete	Œ	B) hume pipe
		asbestos cement	-	cast iron
108.	Intake	e wells are provided to		
	(A)	carry water from a treatment	plant	
	(B)	draw water from a ground so	urce	
		collect water from a surface s		
	(D)	distribute water to the consum	ner	
109.	After 1	oreak point chlorination, chlorin	e rema	ains as
	, ,	free residual	(B)	combined residual
	(C)	free and combined residual	(D)	None of the above
110.	Flotati	on is a process where		
	(A)	lighter particles settle		
	(B)	lighter particles are separated		
		lighter particles are set to float	t unaid	led
	(D)	lighter particles float due to th	e attac	hment of gas bubbles
111.	The co	mmon end products for both aer	obiosi	s and anaerobiosis is
	(A)	H ₂ S	(B)	CH ₄
	(C)	NO ₃	(D)	CO ₂
112.	A unit v	working purely on anaerobiosis	is	
	(A)	septic tank	(B)	activated sludge process
	(C)	trickling filter	(D)	contact bed
113.	The fact	tor deciding the length of a grit o	chamb	er is
		detention period	(B)	horizontal velocity of flow
	(C)	settling velocity	(D)	surface loading
114.	BOD rea	moval in a primary clarifier is		
	(A)	50% - 60%	(B)	30% - 40%
		10% - 20%	(D)	Nil
	•		(-)	



115.	Screen	chamber is employed		
		before grit chamber before trickling filter		after settling before chemical precipitation
116.	Depth o	of Standard Rate Trickling Filter	is	
	. ,	0.5 to 1 m 1.5 to 4.8 m	(B) (D)	
117.	An exte	ension of Trickling filter is		
	(A) (C)	rotating biological contactor bio tower	(B) (D)	
118.	An equi	ivalent term of "Mean Cell Resid	dence	Time" is
	` '	solids retention time sludge detention time	(B) (D)	solids age average cell time
119.	Conven	tional Activated Sludge Process	(ASP)) is not suited to
	(B)	Strong organic wastes Shock loading and varying qua Very dilute wastes High recirculation	lity of	influent
120.	Sludge	from a Biological treatment unit	is	
	(B)	rich in inorganic matter and mi		ganisms
121.	A treatr	nent unit developed on algal-bac	terial	mutual symbiosis is
	(A) (C)	activated sludge process waste stabilization pond	(B) (D)	rotating biological contactor aerated lagoon
122.	Sullage	is		
	(A) (C)	Wastewater from baths Industrial liquid waste	(B) (D)	Drainage from roads Wastewater from toilets



				• •		
123.	Velocit	y of flow in a sewer should be t	etwee	n		
	(A)	0.6m/sec and 3m/sec	(B)	2m/sec and 10m/sec		
	• ,	30cm /sec and 90cm /sec		30mm/sec and 90m/sec		
	(-)		()			
124.	Ovoid:	sewers are best suited for		•		
	(A)	Separate system				
		Combined system with less flu	ıc t uatio	ons		
		Combined system with very w				
		Outfall sewer				
125.	A manl	nole is provided				
		at every 500m intervals				
		at every corners				
		when flow gets divided				
	(D)	when direction or grade chang	es			
126.	Before	entering a manhole a candle is l	owered	I into it		
	(A)	to illuminate it				
		to detect toxic gases				
		to give a signal to the adjacent	manho	ole		
		to find out presence of methan				
127.	A sypho	on spillway is an arrangement to)			
	(4)	1' A DIETE ' A COMO Andre				
		divert DWF into open drain		_		
		divert excessive DWF into ope				
		(C) divert excessive storm water into open drain				
	(D)	divert excessive combined flow	v mto (open drain		
128.	The bac	teria that flourish at high tempe	rature	(greater than 45° C) are called		
	(A)	cryptophytic	(B)	psychrophilic		
	(C)		(D)	thermophilic		
	. ,	-		*		
129.	BOD te	st is not well suited to industrial	waste	s because		
	(A)	it is a slow process				
	(B)	toxic chemicals produce wrong	g result	s		
	(C) the wastes lacks in nutrients					
		oxidation is incomplete				



130.	Iron in	water causes		
	(A) (C)	corrosion stains in cloths	(B) (D)	eutrophication rust
131.	A com	municable disease is		
	(A) (C)	cancer tuberculosis	(B) (D)	
132.	An indi	icator organism is		
	(B) (C)	pathogenic bacteria non pathogenic bacteria facultative bacteria non facultative bacteria of the s	ame f	amily but not a pathogen itself
133.	Autotro	phic bacteria derive energy from	Ł	
	(B) (C)	inorganic compounds organic compounds ultraviolet rays of the sun both organic and inorganic com	npound	ds
134.	An adv	antage of intermittent system of	supply	of water is
	(B)	it is economical supply is assured during a fire a pumping is for limited hours repairs can be carried out during		
135.	Floccul	ators are		
	(A) (C)	sedimentation units slow stirring mechanisms	(B) (D)	instantaneous mixing devices chemical feeding systems
136.	An idea	l crop for sewage irrigation is		
	(A) (C)	potato sugarcane	(B) (D)	beans banana
137.	The usu	al rate of hydraulic loading in H	igh rat	te Trickling filter is
	(A) (C)	1 to $2 \text{ m}^3 / \text{ m}^2 / \text{day}$ 5 to $10 \text{ m}^3 / \text{ m}^2 / \text{day}$	(B) (D)	2 to 5 m 3 / m 2 / day 10 to 30 m 3 / m 2 / day



138.	3. Pedestal type commode is			
	(B) (C)	completely above floor level partly above and partly below completely below floor level completely above ground level		evel
139.	Eco sys	stem is		
		community and environment communities and habitat		species and habitat biosphere and habitat
140.	Haze pa	articles have a particle size		
		less than 0.0002 ppm 1 to 75 μ m	(B) (D)	between 0.0002 and 1 μm Greater than 75 μm
141.	Farmer	's lung is caused by		
	(B) (C)	spores of moulds on hay continuous application of insec spread of pollen vegetable fibres as cotton and ju		5
142.	Paper b	ecomes yellow and brittle because	se of	
	(A) (C)	CO SO ₂	(B) (D)	SPM NO ₂
143.	Ammon	iia in atmosphere		
	(B)	is an inert gas neutralizes acids combines with hydrocarbon to preadily get stabilized as nitrates		ce ozone
144.	Pedal b		nainly	because of grazing on fodder
	(A) (C)	PAN Fluorides	(B) (D)	Cement dust Zinc



145.	When t	he plume rises vertically upward	s it is	
		looping plume fanning plume	(B) (D)	coning plume neutral plume
146.	Silence	rs are used to control		
	(A) (C)	dust particle noise	(B) (D)	-
147.	Rate of as	decrease in atmospheric tempera	ature v	with increasing altitude is termed
		Adiabatic cooling Adiabatic heating	(B) (D)	Adiabatic lapse rate Inversion
148.	BET Iso	otherm accounts for		
	(A) (C)	Multilayer adsorption Only sorption	(B) (D)	Single layer adsorption None of the above
149.	The cor	ncept of Entropy states that		
		there is no equilibrium state all systems tend to approach a s all systems will be acidic all systems will be basic	state o	f equilibrium
150.	Destruc	tive Distillation is also termed as	3	
	(A) (C)	Gasification Pyrolysis	(B) (D)	Incineration Combustion
